SPECIAL NEW CAR SECTION!

Extra Pages of Facts, Photos of the '60 Models

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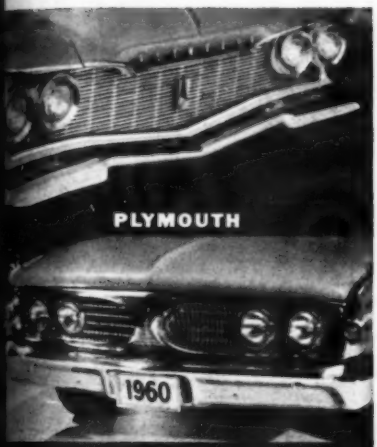

TOM McCAHILL TESTS THE NEW CORVAIR

great to get . .

level,
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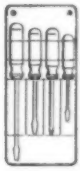
A POPULAR GIFT with plenty of practical appeal. Rugged construction. Unbreakable Tenite head and handle. All exposed metal parts nickel plated. Forged steel jaws.

1950 Ratchet Brace $7.35

MAKE A MAN A CRAFTSMAN with these fine chisels. Four sizes: ¼", ½", ¾" and 1". Plastic pouch. Forged blades and bolsters.

1434 Wood Chisel Set $6.95

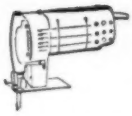


4 TOP QUALITY SCREWDRIVERS — 4" and 6" standard, 3" cabinet and 4" Phillips. Convenient plastic pouch. Tempered chrome steel blades. Shock-proof Tenite handles.

8514 Screwdriver Set $3.95

YOU CAN'T GO WRONG with this accurate 9" pocket level. V-grooved bottom for use on round material. Extra tough magnesium frame will not warp or rust. Perfect for handymen, electricians, plumbers.

290 Torpedo Level $2.95

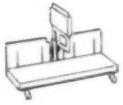


***NEW! 6 SAWS IN 1** — jig saw, hand
coping saw, ripsaw, crosscut and ba
saw! Straight lines, curves, circles and
tricate shapes are sawed easily in wo
metals, plastics.

360 Jig Saw $3

**EVERY HANDYMAN NEEDS A HA
SAW.** Finest quality frame of nickeled
buffed steel with unbreakable Tenite p
grip handle. Adjustable for 8" to 12" bla
Furnished with 10" blade for all 'round

48 Hacksaw Frame ..... $



ACCURATE ANGLES ARE EASY with
rugged mitre box. Select hardwood ba
and solid steel back. Quick-adjusting c
locks saw at any angle. For use with ri
hand saw or back saw.

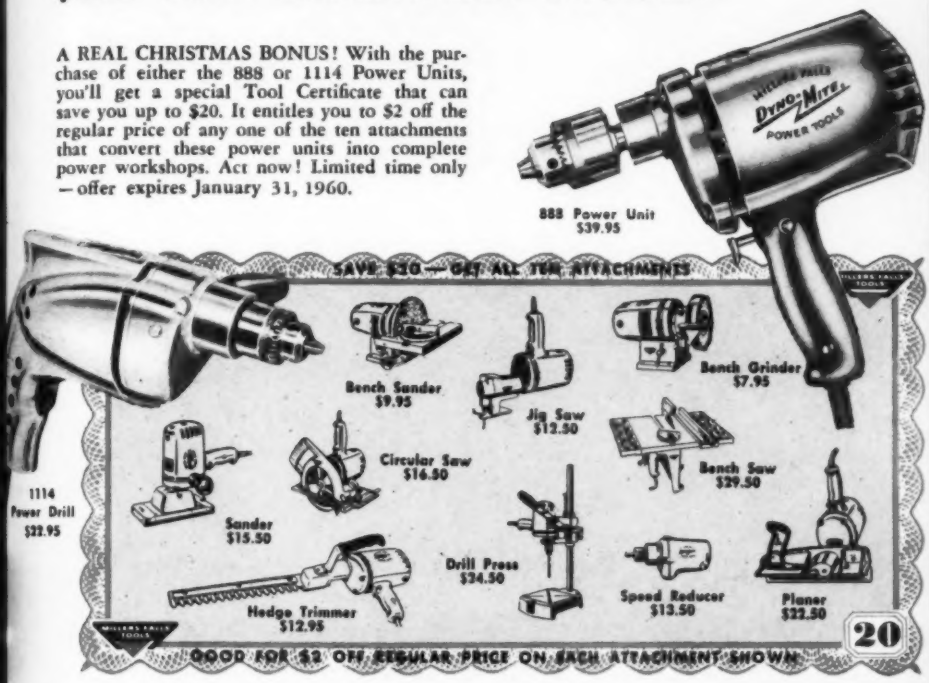
816 Mitre Box ..... $

Millers Falls® plays Santa Claus

WITH A BAG-FULL OF CHRISTMAS BARGAINS!

$20 Tool Certificate FREE!

A REAL CHRISTMAS BONUS! With the purchase of either the 888 or 1114 Power Units, you'll get a special Tool Certificate that can save you up to $20. It entitles you to $2 off the regular price of any one of the ten attachments that convert these power units into complete power workshops. Act now! Limited time only — offer expires January 31, 1960.



FREE Plane-'R-File worth $3.49

Millers Falls will *give* a handy Plane-'R-File to the lucky guy who gets any one of these 3 fine tools for Christmas. There's a card with each — and when it's sent to Millers Falls, a free Plane-'R-File is mailed immediately. Good way to say Merry Christmas twice! Offer expires January 31, 1960.

BARGAIN REMINDER

THIS COUPON MEANS BIG SAVINGS!

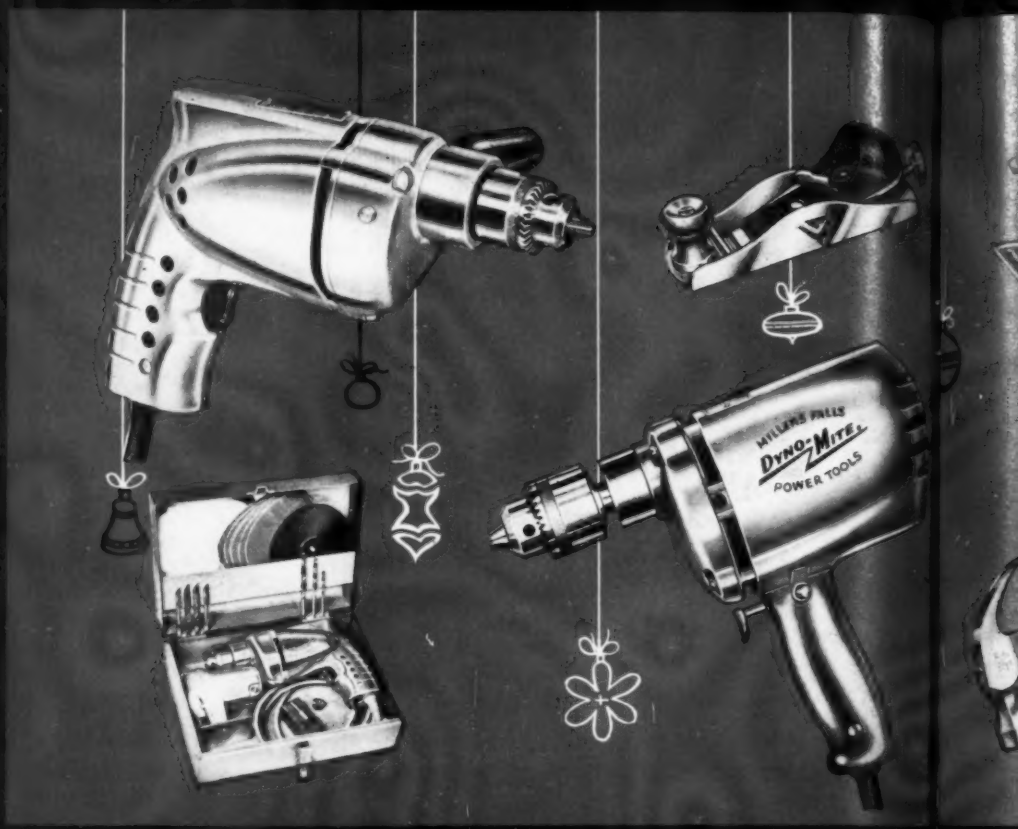
Keep it to remind yourself of the Christmas specials now featured at leading tool centers. For name of Millers Falls dealer nearest you, simply write Dept. M-3, Millers Falls Company, Greenfield, Mass.

FREE $20 CERTIFICATE

Savings of $2 on any one of 10 attachments for the 888 or 1114.

FREE PLANE-'R-FILE

A bonus worth $3.49 when you buy a 360 Jig Saw, 580 Sander or 626 Saw.



Give the

***JOY ALL YEAR LONG** to the man who receives this rugged ¼" drill. Full 2.7 amp. rating gives it all the power needed to drive 14 different quick-change accessories and attachments.

1114 Power Drill $22.95

GOOD GIVING 'N' GETTING, TOO! Contains everything needed for drilling, sanding, polishing, and sawing: 1114 ¼" Drill, Jig Saw attachment with 4 Blades, 3-piece Drill Set, 5" Rubber Pad, 5" Polishing Bonnet, two 5" Sanding Discs, in steel carrying case.

1118 Deluxe Drill Kit
Regular $44.50 — Special $39.95

A REALLY WANTED GIFT for men and boys. This kit contains the same items as the 1118 Deluxe Kit with the exception of the Jig Saw Attachment.

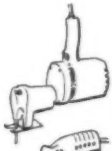
1117 Basic Drill Kit
Regular $34.50 — Special $29.95

ANY FELLA WOU[illegible]CIATE this precision-made plane for working hardwoods and end [illegible] easily by nickel plated screw [illegible]. 7 inches long, 1⅜" wide.

1455 Block Plane ... $3.90

***3 TOOLS IN ONE** [illegible] ⅜" drill, 6-inch portable disc [illegible] 6-inch polisher. Becomes complete power workshop with wide [illegible] attachments.

888 Power Unit ... $39.95



***CUTS ANY SHAPE** [illegible] metal. Attaches to the 888 Po[illegible] 1114 Drill in seconds. Cuts [illegible] in wood. Complete with 4 blad[illegible]

886 Jig Saw At[illegible] ... $12.50

***S-M-O-O-T-H!** This [illegible]ing attachment puts the prof[illegible] on any project. 12 times fa[illegible] sanding. Fits both the 888 and [illegible]

882 Orbital Sand[illegible] ... $13.50

tools that are

VOU ATE this
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w a r. 7 inches
ane . . $3.90

ONE ⅜" drill,
disc 6-inch pol-
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APE metal. At-
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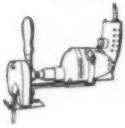
*MAKES LIGHT WORK of heavy jobs. Whether cross-cutting or ripping, this 6" saw attachment for the 888 slices through 2" dressed lumber. Quick, easy adjustments for depth and angle. **8811 Portable Saw Attachment $16.50**

*CUT AWAY hours from those big time projects with this rugged 6½" power saw Packed with quality features. 1 H.P. motor.
626 Circular Saw
Regular $54.50 — Special $49.50

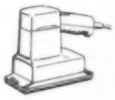
A SURE HIT for any man. Precision hardened and tempered alloy steel head. Octagon shaped hickory handle. Beautifully balanced and finished. Weight 16-ozs., 13" long.
716 Claw Hammer $4.50

HOBBYIST'S DELIGHT! Automatic drill with quick-action chuck locks or releases drill points instantly. Unbreakable Tenite handle holds up to 12 drill points.
170 Automatic Drill $4.00

TRY SQUARE, MITRE SQUARE, depth and marking gauge all in o curate. Easy to read. 12" x 1" steel Cat's-eye level and scriber make it versatile.
1200 Combination Square . . .



ANY DRILL IS A JIG SAW with satile attachment. Saws all sorts of de and odd shapes in wood or metal. E with 4 blades.
2140 Universal Jig Saw Atta . . . Regular $11.95 — Special



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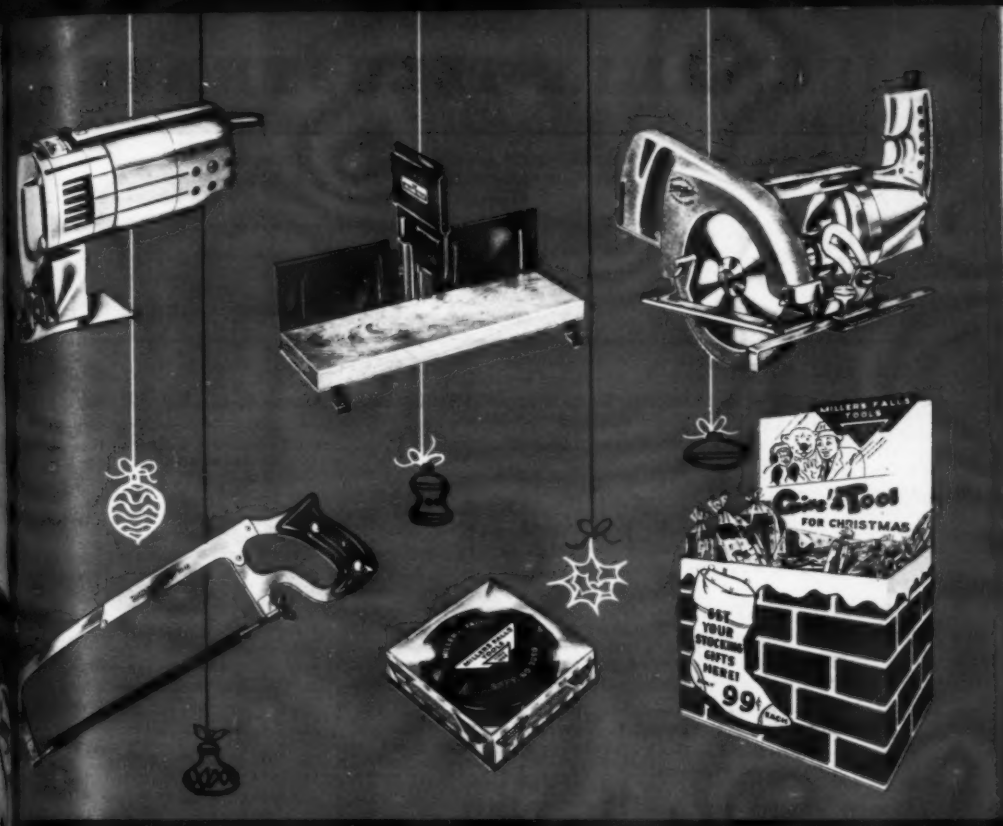
580 Finishing Sander . . . . . .

HAPPY HOBBY DAYS are his w high quality bench plane. 9 inches lo 2" cutter. Quick, easy depth and side ments provide precise control of cut.
90 Bench Plane . . . . . .

Give a Tool

FOR CHRISTMAS

MILLERS FALLS TOOLS
SINCE 1868



Millers Falls

A GOOD RULE FOR GIVING is to give the best with this fine 50′ tape rule. Easy, one-finger winding. Extra strong, rustproof case. Clear foot and inch markings.

2050 Tape Rule $3.29

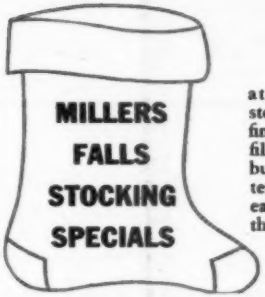
FITS ANY ¼″ DRILL. 5″ circular saw attachment rips, crosscuts, trims, bevels, and mitres. Adjustable rip guide. Telescoping guard.

2170 Circular Saw Attachment . . .
Regular $14.95 — ★Special $12.95

SPECIALLY DESIGNED for the 1114 Drill, this 5½″ saw crosscuts and rips finished 2 x 4's with speed and ease. Rip guide included.

1170 Circular Saw Attachment . . .
Regular $13.50 — Special $11.95

★ See special offer on cover.



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NOVEMBER, 1959

VOLUME 55, NUMBER 11

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How I Turned $1,000 into a Million

--starting in my spare time

AN AMAZING TRUE STORY THAT MAY CHANGE YOUR LIFE

by William Nickerson

WHEN I was 25, my wife Lucille and I started saving part of my first modest earnings as a telephone company employee. In three years we had saved the down payment to buy a home. I began looking about for a way to insure a modest retirement income to supplement my telephone company pension.

Starting with only the $1000 cash equity in my home, I pyramided this modest asset into $500,000 by the time I was 42 — all in my spare time. I retired at 42 to concentrate on my investments — with considerable time for gardening, swimming in our backyard pool, hunting, fishing and traveling.

Many friends turned to me for advice on how they could follow me up the road to fortune. Finally I decided to write a unique guidebook, in which I would share my money-making secrets.

But editors who read my first manuscript told me: "Ah, but your success depended on starting during the depression. It could never happen again!"

This led me to study other men's money-making experiences, and current, non-depression-period opportunities. Although I had not intended to increase my holdings, I found so many opportunities that in 2 years I doubled my estate to over $1,000,000.

Now my book, HOW I TURNED $1000 INTO A MILLION, is ready at last. And in it I reveal — and tell how to use — these 4 basic principles of traveling the last remaining road to great fortune still open to the average person:

1. How to harness the secret force of free enterprise — the pyramiding power of borrowed money. If you have ever experienced difficulty in arranging a commercial loan to go into business, you may have the idea that banks won't lend money to the "little fellow" for the purpose of making money. But I will show you how you can get lenders to put up gladly at least three dollars for every one of yours, thereby quadrupling the earning power of your capital.

2. How to choose income-producing multiple dwellings in which to invest. If you are interested in investing in income-producing property for income alone, then you will probably get along all right without any advice from me, although even there I can give you many tips. But if you are out to pyramid your capital, there is a definite set of conditions you should look for.

3. How to make your equity grow. A fair market value of an income-producing property is in ratio to its income. Therefore, if you increase the annual net by means of the steps I outline, you increase the market value of the property — thereby increasing your equity.

4. How to virtually eliminate the "tax bite" on your capital growth. I will show you how you can increase your net worth steadily without its being subject to income taxes — not even capital gains tax! J. K. Lasser's famous guide, YOUR INCOME TAX, says of this method that "the mathematics have almost unparalleled attraction."

If you have about $2500 right now — or if you can save only $50 a month for the next four years — you can start out soundly along the road to a million dollars. To enhance your progress you will need an additional personal investment of $50 a month, or $600 a year, for two more years after that, making a total investment of $3600. But then you will start receiving income from your investment. *In addition,* if you follow my instructions, your capital can grow at the following rate:

In 2 years, your $3,600 grows to $5,800.
In 4 years, you have $11,575.
In 6 years, $21,681.
In 8 years, $39,363.
In 10 years, $70,548.
In 12 years, $124,884.
In 14 years, $219,972.
In 16 years, $386,376.
In 18 years, $677,583.
In 20 years, $1,187,195.

"There Must Be a Catch to It!"

Right now, it would be understandable if you were sputtering, "But — but — it's not that simple. There *must* be a catch to it!"

Of course there's a catch to it! There are hundreds of "catches" — hundreds of pitfalls and traps for the unwary who have never traveled what I call the "realty road to riches." But I made it, by learning as I went along. And you have a priceless advantage which I never had — the advantage of being able to know beforehand everything I had to learn by trial-and-error.

This method of making money is *not* dependent on continued economic boom or inflation. It *is* benefited and underwritten by America's continuing *population* boom, which is expected to result in 77 million more people by 1980. And it is comparatively recession-proof.

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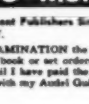

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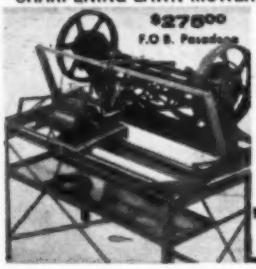

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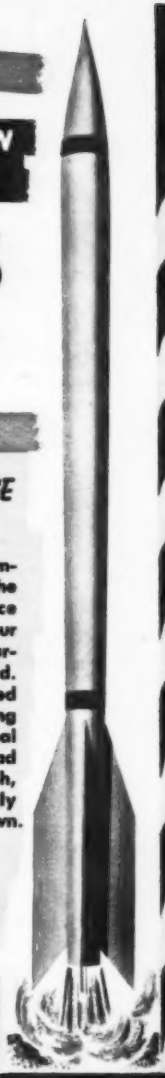

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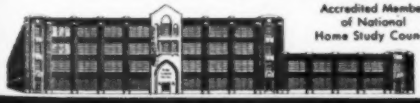

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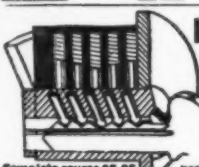

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We Help You Grow

YOUR personal success is of the utmost importance to Headquarters, for as you grow so grows the Duraclean Dealer organization. Thus, your initial training is only the beginning of a continuous assistance program designed to build your business. When you write, phone or visit Hdqtrs., you receive prompt, expert counsel from a staff of specialists. We work with you 12 months of the year. Among the 25 regular services you receive include conventions, regional conferences, new product development, trademark protection, sales letters, sales books, a complete advertising kit, a monthly sales-building magazine plus others. Our whole program is cooperative. Our unique Mutual Cooperation System and customer satisfaction have built this 29-year-old world-wide organization.

What Dealers Say

W. Lockshill (St. Louis): My 28th year! Began during depression and built business on good service.

B. Chilcott (N. Platte): Duraclean say gross $9.00 per hour. I gross up to $12.00. Many dealers do much better.

M. Lyons (Chgo.): 3rd year should hit $100,000; 2nd was $60,000; 1st $40,000. Hdqrs. help make it possible.

E. Roddey (Hampton, Va.): Did $600.00 first 12 days in January. My business keeps growing each month.

A. Wilson (Tulsa): Made $1,299 this month working alone. Duraclean outperforms all competitors.

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You are backed by a national advertising program which is larger than all other similar programs in the industry combined!

Consumer Advertising: Ads dramatizing your unique services reach millions of homeowners through leading magazines as Parents', House & Garden, Canadian Homes & Gardens plus many more.

Trade Advertising: More and more retailers are turning over customers to Duraclean Dealers for servicing. Key trade journals are used to target local furniture stores, dept. stores, dry cleaners, decorators, etc., to become your agents.

To coordinate both trade and consumer campaigns in your town, we provide you with tie-in promotional materials such as ad reprints, display cards, direct mail pieces, ad mats and others.

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These two important honors conferred on Duraclean give PROOF of your superior services. As a Duraclean Dealer, you will be the only cleaning service in town backed by both these famous seals. No wonder customers buy Duraclean so quickly!

What Manufacturers Say

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". . superior to any on-location process with which I'm familiar." —*President, Modern Tufting Co.*

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• *How-To*

Do you have plans for building a smokehouse?

J.F.T.
Bridgeport, Pa.

Plans, *for a smokehouse? You just build a small tight house or shed with no chimney or windows, and enough room inside for a stove or firepit and hung meat. You slaughter your hog, or whatever, let it cool down in the cellar and then hang it in the smokehouse. Then you build a fire of hickory wood and shut the door. Without air the fire will smolder. From time to time throw on more hickory. They say meat cured with a new hickory-flavored salt is just as good but we don't believe it. You can get more details about curing meat from Extension Service, U. S. Dept. of Agriculture, State College, Pa.*

• *Thnaks Annyway*

I am interisted in submitting material to your magazine. I would appreciate you sending me a writting, pictorial requirement sheet or any other information that you feel would be of interist to me.

J.T.L.
Keesville, N. Y.

We got enuf good writters. What we luking for is some good spelers.

• *Bottle Collecting*

Would you have any idea how much interest there is in collecting bottles? About how many such collectors there are, the types of bottles they collect and how large the average collection might run?

Claudia Boynton
Chicago, Ill.

Without having accurate figures on bottle collectors or bottles, we can say there are enough to make it pay for any antique dealer to carry bottles—mainly of American make, 1808-70. Beginners look for likenesses of Washington, Taylor or other great Americans, or fanciful designs of a primitive style. Pontil marks (round scars) on the bases and sheared necks indicate pre-1850 manufacture. For more info, try American Glass by Helen and George McKearin, Crown Publishers, Inc., 419 Fourth Avenue, New York, N. Y. Steven Van Rensselaer's Early American Flasks And Bottles is now out of print but can be found in some libraries; it's the top work on bottles. Most bottle collectors are men.

• *Mopeducation*

I am planning to put a motor on my bike for much-needed transportation at college. If you have any information on kits available, that would help.

Charles Collins
Ijamsville, Md.

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[Continued on page 32]

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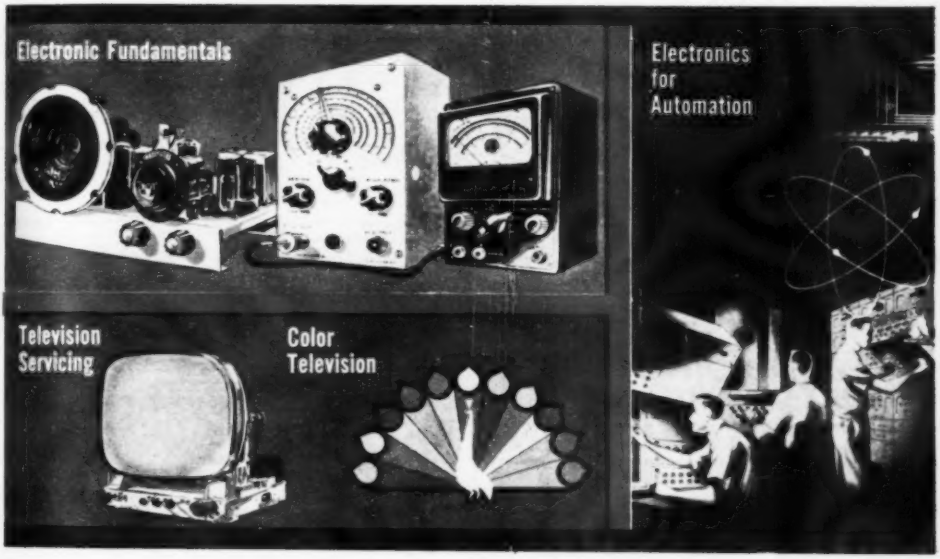

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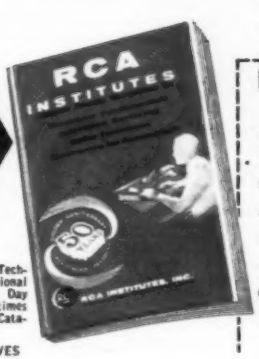

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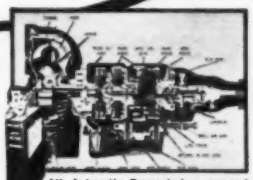

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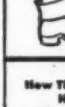

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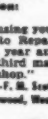

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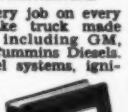

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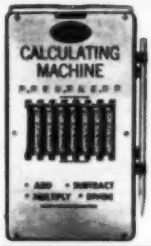

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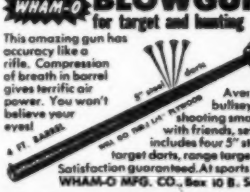

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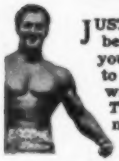

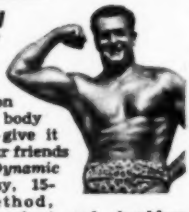

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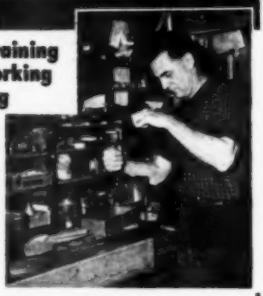

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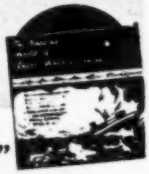

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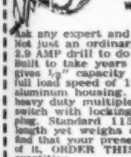

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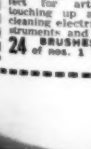

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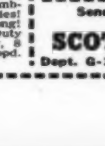

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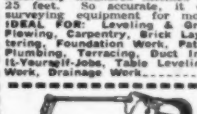

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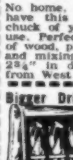

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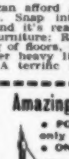

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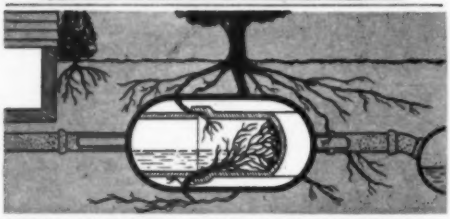

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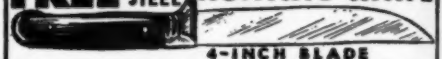

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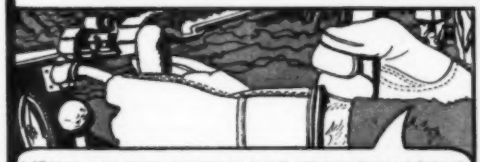

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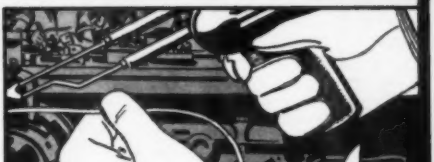

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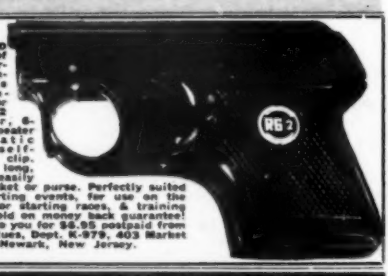

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Dear Editor

[*Continued from page* 16]

• *Atomic Plane*

After reading How We Bungled The Atom Plane by Rep. Melvin Price in the Aug. MI, I couldn't resist writing this letter. It seems that funds are the most important factor holding back this vital project. I have a solution. At least 435 people won't go along with it—but here goes anyhow:

The 435 members of Congress are paid the outrageous salaries of $22,000 to $25,000 per year plus expenses. Some of their office employees are paid as much as $19,000 per year for $6,000 jobs. By cutting Congressmen's salaries to $15,000 and their top aids to $8,000 we could gain $6,525,000 per year toward vital projects such as atom planes. This shouldn't be asking too much of the dedicated Americans in Congress.

Jere F. Allan
Coachella, Calif.

Our engineers decided years ago that atom-powered planes would never be feasible due to the weight required for shielding the crew. A large, slow atom-powered plane would not be a tactical airplane. It would be an excellent target, however.

P.S.M.
Oklahoma City, Okla.

What engineers decided years ago cuts no ice today. There are light shielding materials now and it is politicians, not engineers, who are against developing an A-plane (read the editorial in the Aug. 3rd Aviation Week). Rep. Price did not suggest a tactical A-plane.

• *Communicators*

I want pan-friends through your Magzin and I hope well about above mentioned desire. I am 18 and my main hobbies are stamps, view cards, dancing and music.

M. Ishaq Qureshi
1123 Kharass Mohalla
Lahore Cantt. (West Pakistan)

I am 17 and interested in hypnosis, telepathy and things in that line. I would like a pen friend who is interested in the same things—outside the U. S. and Canada. If you are interested send your name and address to MI and I shall write to you.

Ruby

East is East and West is West and maybe the twain shall get together. We have no address for Ruby. Don't send letters here—if you, too, are interested in telepathy, just send out thought waves crying "Ruby! Ruby!"

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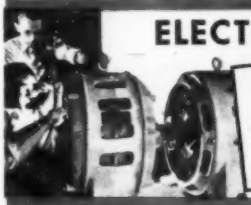

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Republic is already experimenting with raising turnips, carrots, beets and snap beans at various altitudes to see if significant increases in crop production can be obtained by growing them at low pressures and by lengthening the working day. Tests have indicated that increasing the length of the day—a lunar day is about 14 earth days of sunlight—the growing period can be cut in half.

Anyone for a dish of moonbeans?

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For unmatched action, tap the resources of the Tempest 425 with Tri-Power! This fiery, famous power plant is one of a wide range of power packages available in the 1960 Pontiac. Every one is a finely honed version of the respected 389 cubic inch Tempest and one (the 425E) performs on regular gas.

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PONTIAC THE ONLY CAR WITH WIDE-TRACK WHEELS

Mail for McCahill

Uncle Tom is sorry he can't answer all his mail personally. In this column he'll answer the most interesting letters. Write to him at MECHANIX ILLUSTRATED, 57 West 44th St., New York 36, N. Y.

● *I've just finished reading your new book, Today's Sports And Competition Cars, and think it's great. I was particularly interested in your section on rallies, and that's why I'm writing you this letter. Several years ago, my wife, MG and I participated in a number of local rallies. However, I feel they've now become ridiculous and defeat their original purpose. Many rally cars today are equipped with hundreds of dollars' worth of special instruments, and some cars actually use full-size Monroe Calculators to compute their average speed, distance, etc. I feel that this has ruined the sport as it once was, and that equipment should be limited to things the average automobile fan might own, such as a stopwatch, roadmap and maybe a clipboard with lots of paper and pencils. This would prove the driver's and navigator's skill, which a battery of robot thinkers can't possibly do.*

J. B.
Fairfield, Conn.

I couldn't agree with you more. Rallies have become pretty close to ridiculous when the size of a participant's pocketbook can determine the outcome, providing he isn't an out-and-out moron. No doubt a team of Cape Canaveral kids plus several thousand dollars' worth of instruments (including miniature Univacs) could run nearly any length rally, under ideal conditions, without the loss of a single point. Then what the hell would you have? I'd like to see all rally cars limited to $100 worth of extra equipment, and run in absolutely stock condition. This would allow for the purchase of suitable timing equipment and other basic necessities. The rest would be up to the intelligence of the navigator and the driving skill of the driver. In any activity, the more the possibility of error is reduced the less it resembles sport.

● *Last week I saw a car parked in Philadelphia. The rear looked exactly like a '56 or '57 Merc. The body shell was Mercury too, but the grille looked like it had been lifted from a '55 Packard. The name on the front was Monarch and the name on the side was Richelieu. Could you give me its origin?*

Walter J. Kuleck
Springfield, Pa.

Richelieu was one of the hardest-hitting Cardinals since Stan Musial. Mercury was a Greek runner who was crossed with a chicken and wound up with feathers on his feet. Hope this answers your question. (P.S.: The Monarch is a Canadian Ford product.)

● *Last week I stopped at a gas station and filled up with gas. I got about a mile outside of town when the car conked out completely. We hailed a ride into town, got a mechanic, and towed the car to his garage. After going over several things, the mechanic showed me that the fuel pump was pumping almost clear water. Then he drained about five gallons of water from the bottom of my gas tank. The mechanic volunteered to go with me to the gas station to prove what he had found. After some talking, the mechanic asked the station attendant to pump a gallon of gas. It turned out to contain over a quart of water! I was refunded the price of the gas, but in all my 35 years of driving I have not had such an experience, nor have I heard of such a thing happening. Can you account for the water being in the gas storage tank?*

Stanley M. Adamson
Council Bluffs, Iowa

Getting water in your fuel tank from your friendly gas dealer is not at all uncommon, though it is rare to get it in such large amounts. The dealer may be the most reliable in the state but he has very little control over condensation which can create quite a lot of water in a large tank. Frequently, leaks in the storage tank itself allow water to seep in. When I ran my garage, our tanks

[*Continued on next page*]

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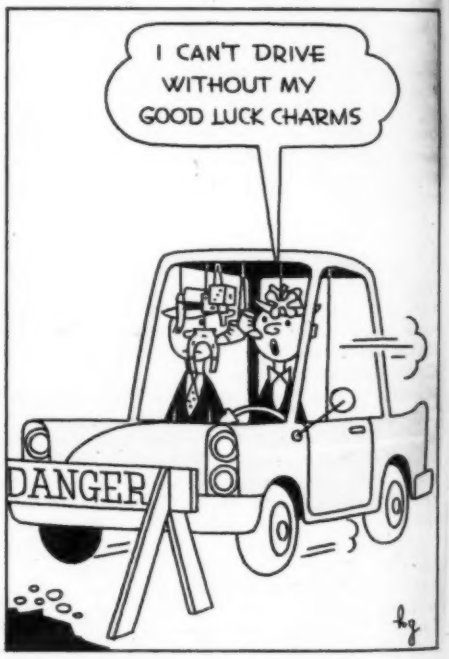
were pumped for water at least twice a year, and we rarely failed to pull several or more gallons out, just through condensation. Usually, when large amounts of watered gas are encountered, it means the storage tank is very low in fuel, if not practically empty. Since the water is heavier than the gas, it sinks to the bottom of the tank.

The average automobile running on the highways today will usually have a cupful or more of water in its gas tank, just from condensation, and this in a 20-gallon tank. You can see how this could multiply in a 1,000 or 2,000-gallon storage tank. Many years ago in MI I told how I started out on a trip to California from New York during zero weather and had taken aboard a large load of watered gas. This kept freezing, locking up the entire system. I beat it by pouring several quarts of alcohol anti-freeze into the tank, which picked up the water.

● *Would a good non-detergent motor oil be as good or nearly as good to burn in*

[*Continued on page* 54]

DON'T DO-ITS



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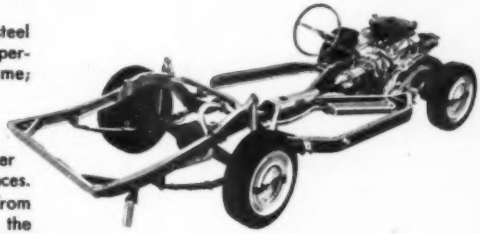
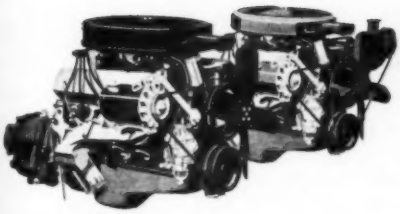
For 1960, Oldsmobile brings you a new kind of ride—comfort-balanced four ways.

1. **Wide-Stance Chassis** provides a wider, lower base—gives a road-hugging, steady, stable ride.
2. **Guard-Beam Frame** gives the protection of a steel framework around the passenger compartments; permits the body to be mounted directly on the frame; eliminates "outrigger" type attachments.
3. **Nylon sleeves** inside Olds shock absorbers wear less—together with new "constant-viscosity" shock absorber fluid, produce a smoother, better controlled absorption of all bumps and bounces.
4. **Vibra-Tuned** body mountings insulate body from road noise and harshness—make the '60 Olds the quietest Olds ever!

See your local Oldsmobile Quality Dealer!



. . . NEW BALANCE OF POWER!



Olds engineers solved the power vs. economy question with two new Rocket Engines for '60.

New REGULAR ROCKET Engine gives traditional Dynamic 88 "Go" on regular, lower-cost gas—standard on every Dynamic 88 model for '60. Owners save about a dollar bill every fill!

New PREMIUM ROCKET Engine for Super 88 and Ninety-Eight models, gets the most in spirited action from premium fuels. Develops 315 h.p.; 435 lb.-ft. torque. Multi-Jet carburetion; 9.75-to-1 compression.

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Impala Sport Coupe—one of 16 fresh-minted '60 Chevrolets you can choose from.

SUPERLATIVE '60 CHEVROLET

Here's new gem-bright beauty, new room to sprawl in and sit tall in. New lean-muscled engine economy, new spirit and silence in its going. For fineness of features, for precise craftsmanship —for all the things that make a car good to own—the '60 Chevrolet stands alone in its price field.

Just wait till you see it. Everything about the '60 Chevy, every styling accent, every engineering detail, has been polished and refined to a degree of perfection never before thought possible of a car in Chevrolet's price class.

Picture practicality and economy combined with the luxury and hushed comfort usually associated with high-priced cars. That's Chevy! You have to see it up close to appreciate its fine workmanship. You have to take a turn behind the wheel to know its astonishing smoothness and almost total absence of road hum and vibration. We'll admit our enthusiasm's showing just a bit — but once you've dropped into your dealer's we're sure yours will be, too. *There's nothing like a new car—and there's never been a new car like this '60 Chevrolet!* . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

NEAREST TO PERFECTION A LOW-PRICED CAR EVER CAME!

NOW! THE REVOLUTIONARY Corvair★ BY CHEVROLET WITH THE ENGINE IN THE REAR WHERE IT BELONGS IN A COMPACT CAR! ★★★

You have your choice of two Corvairs—this one's the de luxe Corvair 700.

America's only car with an airplane-type horizontal engine!
America's only car with independent suspension at all 4 wheels!
America's only car with an air-cooled aluminum engine!

The rumors about this one were right—but they didn't go far enough. Because here, for the first time, is a truly compact, economical U.S. car that retains the ride and 6-passenger comfort you're used to in a big one. The key to this small miracle: America's first and only *rear-mounted aluminum engine*—a revolutionary 6-cylinder power plant that combines compactly with the transmission and drive gears in one lightweight package. You'll get up to 30% more miles to a gallon and—because this engine is *air cooled*—you'll never have to fuss with antifreeze.

Corvair's size—almost 5 inches lower, 2½ feet shorter, 1,300 pounds lighter than conventional sedans—makes it a joy to jockey through traffic and park in tight spots. Yet its unique Unistrut Body by Fisher offers plenty of room for 6 broad-shouldered passengers. And, thanks to Corvair's rear engine, the floor is practically flat, front and rear, so there's generous foot room. Shifting engine weight to the rear also adds extra ground-gripping traction and gives better compact car handling and braking. And with *independent suspension at all 4 wheels*, Corvair rivals much more costly cars in the poised, unruffled way it rides.

A price your budget will appreciate. Wonderfully practical as all these advances sound, you'll find the most practical thing about this new Corvair is its price. Make it a point to visit your Chevrolet dealer soon—and see what a wealth of engineering a modest amount of your money buys! . . . *Chevrolet Division of General Motors, Detroit 2, Michigan.*

THE FLOOR IS PRACTICALLY FLAT—Trunk's up front. Lightweight rear engine is world's first production 6 with ultra-smooth power of horizontally opposed pistons. Pure and simple as modern architecture. THERE'S NOTHING LIKE A NEW CAR—AND NO COMPACT CAR LIKE THE CORVAIR . . . by CHEVROLET!

[Continued from page 50]

an outboard motor as the regular outboard oil?

Lewis Lake
Peshastin, Wash.

Comes from the same well, Jack.

● *I think that if racing men really want to contribute to automobile development they might consider limiting the size of the engines to external dimensions only. This would create dozens of new practices and internal designs that have been sorely needed for many years. For example, the milk companies have proven that you can pack more square milk bottles in an ice box than you can round ones. If the engine sizes were limited to external dimensions, we might even have square pistons (with slightly rounded corners, like the milk bottles), or even oblong pistons. Give me one good reason why a square piston wouldn't work as well as a round one? I realize the lubrication system would have to be reworked slightly with such a design, but feel this is only a trivial problem. Certainly less space would have to be devoted to water-cooling passages, and air-cooling might be employed either in part or whole. What's wrong with this idea?*

Jerry R. Babcock
Memphis, Tenn.

Sounds like a rather novel idea to us, Jerry. But you're sure going to put the Perfect Circle Co. in a helluva fix with those square pistons.

● *When is Detroit going to give us air-cooled engines?* *H. C. Howell*
Jacksonville, Fla.

They've been making nothing but air-cooled engines for years. If you have any doubt, disconnect your fan belt in New York City on any hot July day and see what happens. What I believe you meant was "100 per cent air-cooled." Wait and see.

● *I read in MI that you have a dog named Boji. How come? What's it mean?*

Fred Drake
Toledo, Ohio

Boji's full A.K.C. name is Nodak's Boji Boy. He was born in Fargo, N. D., at M. G. Taubert's farm. I imagine Taubert named him but I have no idea what Boji means. It might be of Indian, German or even Scandinavian origin. If any reader should happen

[Continued on page 56]

SAY **Merry Christmas**

with train boards, tree platforms, Santa Claus, his sleigh and reindeer, Christmas Greetings displays

Make them yourself—with foolproof patterns

These Christmas figures and displays are big and bright and colorful. Yet you make them yourself—easily, quickly and with professional results.

On your roof, porch or lawn—or in your living room—they show the world your Christmas spirit.

Your lumber dealer will sell you the Easi-Bild* Patterns you want. Each pattern includes the full list of materials and paint you will need. You buy these from your lumber dealer, too.

Each pattern is full-size. You simply trace it onto a sheet of ⅝" Homasote—then cut it out with a key-hole saw. Your pattern includes complete instructions for the painting. It's as easy as that and the results are truly professional.

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Homasote is the oldest and strongest insulating-building board on the market, saws and nails easier than wood, takes any paint or stain, lasts for years.

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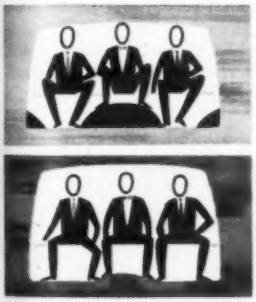
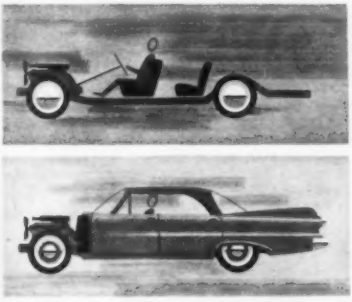
NEW Low-Priced Dodge Dart Features Revolutionary ALL-WELDED Unibody Construction

Roominess and riding comfort took a big step forward with the announcement of the new low-priced Dodge Dart. The more efficient one-piece Dart Unibody scored a major breakthrough in boosting interior room and comfort by eliminating space-wasting side rails and crossmembers. Strength and durability are integrated into the body itself. Conventional squeak and rattle-causing attachment of body to external frame eliminated.



Notice how new integrated strength puts more usable space inside. There's more room for feet, hips, shoulders, hats. Seats are deeper, thicker. Doors are bigger, open wider.

Long-lasting beauty and a higher trade-in value are assured by 7 separate rust-preventive dippings, four sprayed-on coats of primer and Lustre-Bond enamel for a tough fade-free finish.



In conventional body-frame design, strength is concentrated in the frame. Weak body is subject to squeaks, rattles. Unibody equalizes the strength through the entire structure. Body squeaks and rattles are a thing of the past.

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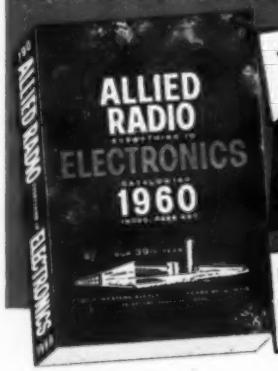

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Mail For McCahill

[*Continued from page* 54]

to know, I'd be glad to hear about it as Boji is my top dog.

● *I am writing to you in sheer desperation. My problem is this: I am unable to procure anywhere in Australia any type of book or manual covering Buick, Pontiac or Nash cars. This may seem silly to you, but if you could put me into contact with some person that could supply these manuals I would be very happy. I'd like them from 1938 to 1958.*

D. Haywood
Willagee, Via Freemantle,
Western Australia

Motor's Auto Repair Manual covers all American cars and some imports and has been the bible of repair shops in this country for years. A note to them should get you squared away. Their address is: Motor, 250 West 55th Street, New York, N. Y. Incidentally, for several years I've been hounding the American automobile industry on the idiotic instruction books they give with their new cars. A reader recently sent me the excellent instruction manual that comes with the Rambler American. It's the first break to come along in years in the no-information service that exists between most factories and buyers.

● *In Mail For McCahill of May '59 you said that Henry M. Leland produced the first Lincoln, which was a V8, in 1921. In a short paragraph in the April '58 MI, Ford's 25,000,000th V8, the writer said that the first V8 to come off the assembly line was a 1932 Ford, and that no one but Henry thought that such a thing could be made.*

Michael Leach
Scott City, Kan.

I didn't write that little gem in the April '58 MI, but allow me to point out that there were many V8s being built before Ford got into it by buying the V8 Leland Lincoln. For example, Cadillac's been building V8s since 1915 and Chevrolet had a V8 in 1917. Old Hank was strictly a Johnny-come-lately in this field.

● *If V8 engines and souped-up sixes are as good as the car makers say, how come most of the big racing cars carry four-cylinder engines? What's wrong with a good, husky, solid four-cylinder engine anyhow?*

Robert A. Brown
Shelbyville, Tenn.

Nothing's wrong with a good four-cylinder engine at all. They have a lot more torque

[*Continued on page* 58]

See Why New LOW PROFILE SAFETY SHAPE Tires

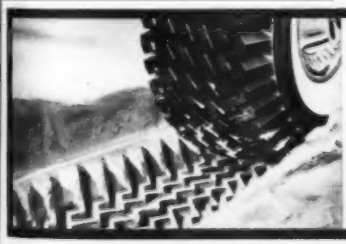
KEEP YOU SAFE WHILE THEY SAVE YOU MONEY!

U.S. Royal's radically new tires run cooler, are safer, give up to 35% more mileage, save gas—yet cost no more!

LOWER! WIDER! MORE RUGGED! SAFER!

The fellow on the right has a lower, wider stance to give him strength and stability. In the same way, U. S. Royal's new Low Profile tires are lower, wider than conventional tires. They have the extra ruggedness and stability needed to keep you safe and give maximum wear—especially on today's fast, non-stop super-highways.

Above diagram shows how Low Profile tires are lower and wider than ordinary tires. Engineered closer to actual working shape. So they don't flex as much. Don't strain as hard. Run far cooler than ordinary tires. They're safer against tire failure at high speed. Safer on turns. Safer against skids. They wear longer. Roll easier—save gas. Originally a premium-tire feature—now at no extra price. Ask your U. S. Royal Dealer.



Newest Addition to the "Low Profile Line"

THE U.S. ROYAL

LOW PROFILE *WINTERIDE*

Brawny, extra-deep lugs haul you through snow and mud—give you non-skid stops on wet roads. Yet with all this brute traction, the new *Winteride* rolls quietly on clear roads!

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Mail For McCahill

[*Continued from page* 56]

per cylinder than a V8 of the same size, but they're not quite as smooth. "Eight" sounds like twice as much as "four" which gives the Detroit pitchmen an easier message for the shell-like ears of Madame Suburbia, the typical buyer. "Smoothness" is a must—especially important to people who don't understand engines. One of the smoothest engines in the world, though, is the Rolls-Royce Six, which relies on its excellent workmanship and perfect balance for its smoothness. In crude assembly, lumps will be a lot less noticeable in an eight-cylinder engine.

● *This year I took your advice and purchased a 1959 station wagon and believe me, it has been all the car you claim on cornering ability, riding quality and even performance. Two complaints I have are: In rain, snow or wet weather, the rear glass becomes so dirty within a very few miles that visibility becomes non-existent. It seems to me that a wiper could be installed on this back glass that would remedy the situation. Number two: I cannot find any combination of wing vents, windows open or closed, ventilator open or closed that will eliminate the terrific exhaust fumes taken into the vehicle upon deceleration when the back glass is down to any extent. Believe me, Tom, this becomes so bad, especially in the 50-60 mph slow-down range, that the fumes will almost make you sick. After a complete day of driving, a person becomes pretty well disgusted with the obvious answer—to wear a gas mask or leave the back glass up entirely, which would be defeating the purpose of having air flow through the vehicle. That was one of the reasons I purchased a wagon in the first place, as I do a lot of summertime driving. Have you any ideas to help aleviate this condition?*

Ed Lothrop
Mansfield, Ohio

The rear window dirtying up in foul weather is a pretty universal fault with all station wagons due to the shape of the body at the rear, which creates a terrific suction as it slides through the air. Exhaust fumes are also another problem, but this shouldn't be too bad if they are exhausted through pipes bent out to each side. On the west coast you see many station wagons with chrome exhaust pipes that lead up the outside edge of the body and exhaust a few inches above the roofline. —*Tom McCahill*

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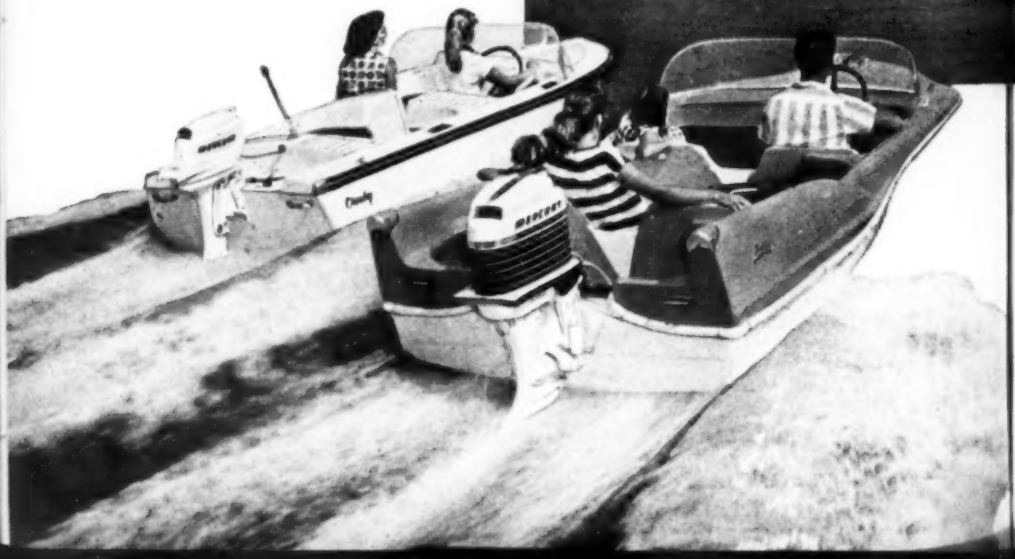

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NEW IN-LINE ENGINES! Modern small-bore, short-stroke design that delivers the most horsepower per pound, per cubic inch, per dollar, *and* more miles per gallon!

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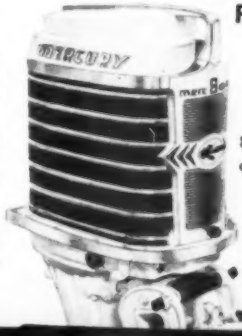

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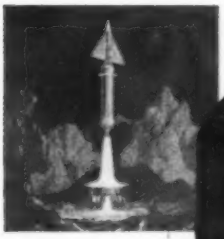

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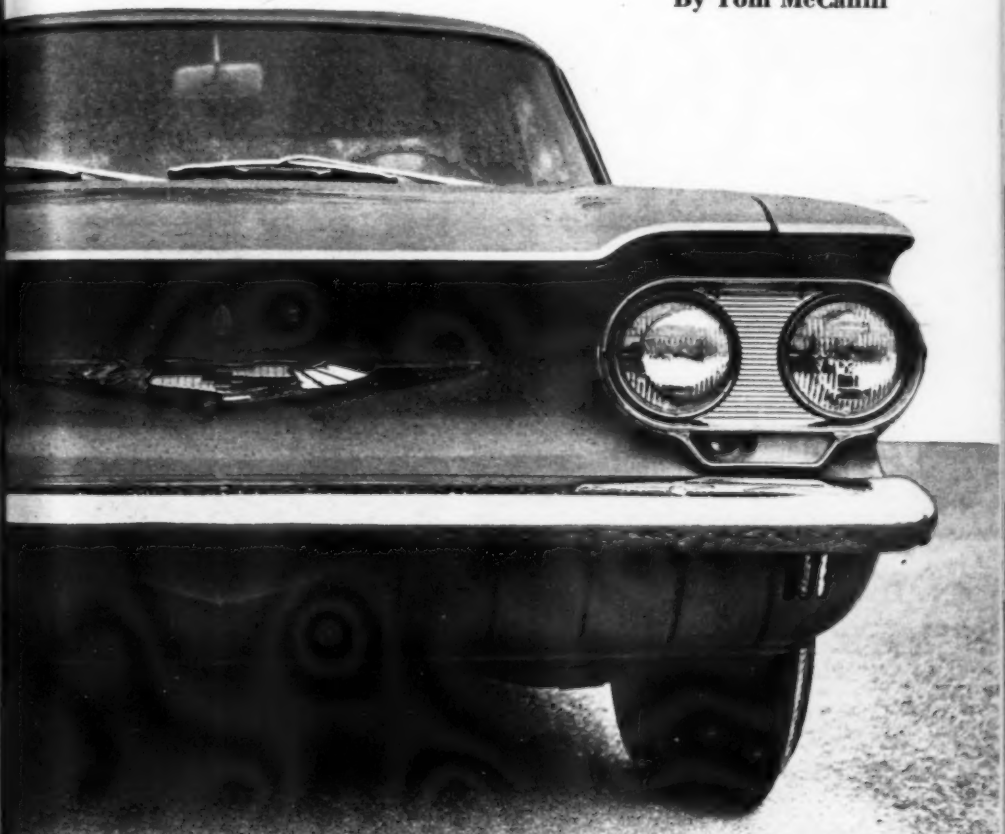
MECHANIX ILLUSTRATED

McCAHILL TESTS THE NEW

CHEVY CORVAIR

By Tom McCahill



THE Chevrolet Corvair is the first entirely new-type American automobile to be built since the Tucker and three-wheeled Davis. The Corvair is General Motors' (specifically, Chevrolet's) entry in the compact car derby. From any angle, it's a ter-

"This is the best handling rear-engine car I've ever

"THERE is plenty of room for four people" reports Tom of the 108-inch wheelbase car.

rific rig which should cause quite a stir.

At first thought, it took a lot of industrial guts for Chevy to come out with an air-cooled rear-engine car—or did it? After all, the Volkswagen is still King of the Imports and right behind VW is the Renault Dauphine, meaning we find two tail-winders in the one-two spots in import popularity. Months before the Corvair's introduction, competitive companies started ad campaigns aimed to discredit rear-engine rigs. With mixed feelings, it is my duty to inform these competitors—kids, you're all wet when it comes to the Corvair.

This is the best handling rear-engine car I've ever driven, with none of the flaws usually associated with such a design. In fact, it not only outhandles the VW but the relatively expensive Porsche as well, even though I must concede that neither of the Krauts are the world's safest vehicles to get careless with.

Since the early days of rear-engine design (more precisely, the German-made racing Auto-Unions), cars of this type, due to their reverse balance and usual oversteering qualities, have killed many race drivers. The Porsche, a magnificent piece of machinery, nevertheless has been the last mount of quite a few racers, including my late friend Jean Behra, champion of France, who was killed in one this past August. Naturally, when I went out to Michigan to test the new Corvair, I intended to look hard for any flip tendencies and oversteering characteristics.

The day I arrived at the GM Proving Grounds proved the perfect day for getting yourself upended in a car with poor handling properties. It was raining and the surface of the road-handling course was black asphalt—a regular Alfred Hitchcock day for dangerous doings. After a few warm-up laps at open throttle (which is 85 mph, right on the nose—a high-speed kit will be available soon), I decided now was the time to find out about the Corvair.

At first I tried gentle side whips, breaking the rear away slightly around bends. The car steers like a feather and is extremely quick. In 15 minutes I was putting the Corvair into full broadslides.

driven," says Tom of America's compact new Corvair.

CORVAIR steers like a feather and is extremely quick, in opinion of MI's expert.

Then came the most crucial test of all. I threw it into spins and drifted off course onto dirt and gravel, then back onto the asphalt again. I feel absolutely certain that if I had done this with some other rear-engine cars I'd have been grasping a lily in a mahogany box before the next sun-up. This Corvair is a magnificent-handling automobile. If it has

TEST CAR SPECS

MODEL TESTED: **Chevrolet Corvair** four-door sedan (with automatic transmission.).
ENGINE: **6** cyls; **140** cubic ins; **80** brake hp; **125** ft-lbs max torque; **8** to **1** compression ratio. Bore **3.375** ins; stroke **2.80** ins. Fuel required: **Regular.** Standard axle ratio: **3.55:1.** Wheelbase **108** ins; length **180** ins; height **51.3** ins; width **66.9** ins; front tread **54** ins; rear tread **54** ins. Weight **2,355** lbs. Gas tank capacity **11** gals. Turning circle diameter **39** ft. Tire size **6.50X13.**
PRICE (without optionals): **About $2,000.**
PERFORMANCE: **0-30** mph, **6** secs; **0-50** mph, **13.1** secs; **0-60** mph, **19.9** secs; **0-70** mph, **28.1** secs; **40-60** mph, **10.2** secs. Top speed **85** mph. All times recorded on corrected speedometer.

AIR-COOLED rear engine puts out 80 hp and gives the new GM car top speed of 85 mph.

TRANSMISSION hump is absent in rear-mill rig, legroom greater than many "big" cars'.

UP FRONT is where the luggage is carried. Deep bin holds a lot more than it appears.

DASHBOARD is compact, neat, simple. The automatic shift is to the driver's right.

any killer tendencies, I couldn't find them—and I tried every trick in the book.

The car was equipped with the new U. S. Rubber Low Profile tires. I've done testing for U. S. Rubber on a commercial basis and I know these tires are good. But while the tires' design is definitely important to the car's stability, in all fairness the tires can't take full credit by a long shot. This is a beautifully designed automobile, engineered by real pros with loads of racing experience (whether they like to hear it or not).

Now as to the comfort: this job rides like a mallard in a rippled pond, with all the ease of an overheated barfly inhaling a frosty beer. It is absolutely void of harshness. There is plenty of room for four people, regardless of their size. More can be crowded in but four can be comfortable. [*Continued on page* 178]

INDEPENDENT swing-axles cause rear wheels to toe in when they leave the ground.

FILLER CAP for the up-forward gas tank is on the left front fender of the stylish car.

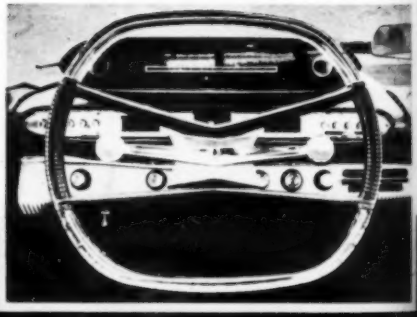
McCAHILL REPORTS ON

The 1960 Cars

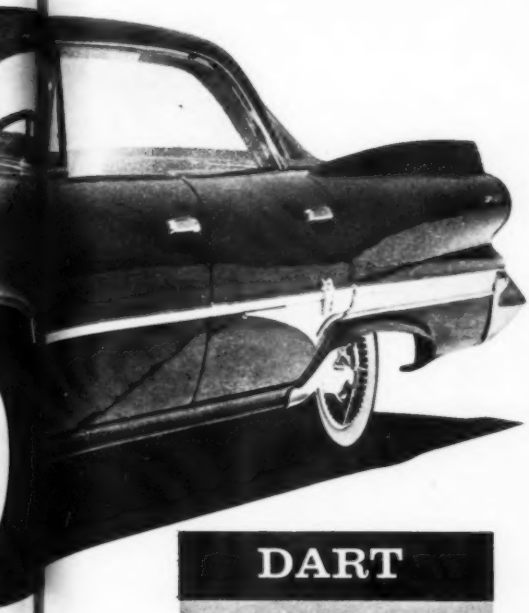
New models, new styles and new engines are featured in this most exciting automotive year!

The 1960 Cars

DODGE DART, brand-new this year, will come in two and four-door models and station wagon, with new six-cylinder mill or V8.



SQUARE steering wheel will be optional on new Plymouth. It is designed to give the driver more kneeroom, better visibility.



DART

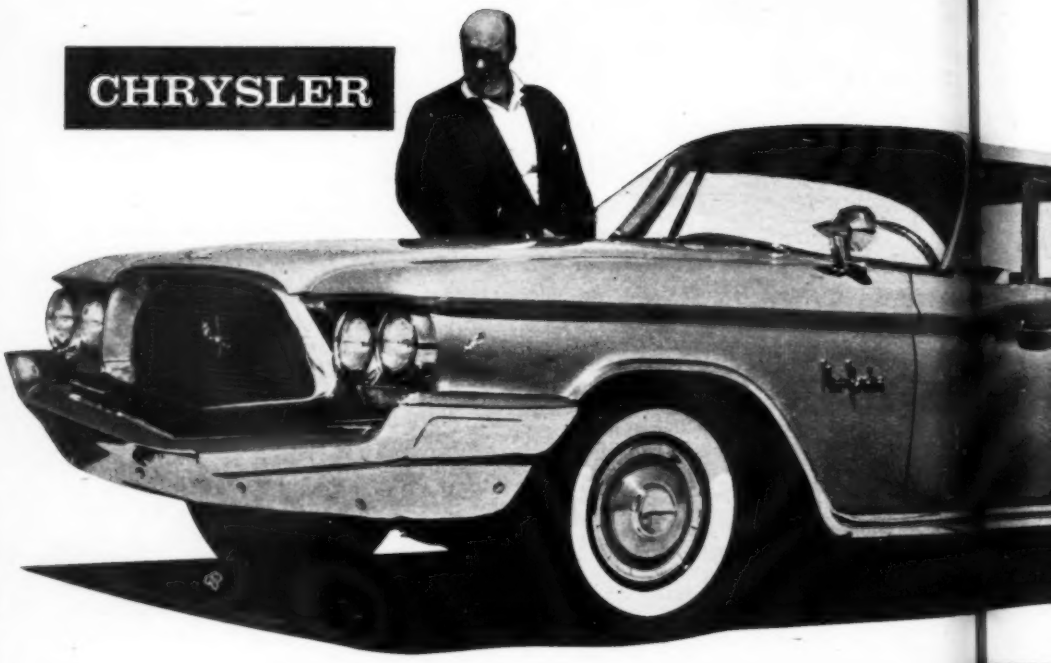
THE wildest alleycat fight since Finnegan needled the beer is about to take place in the American automobile world for 1960. Not since the first post-war models of '46 has the guessing board been so active in "The world's biggest poker game," as Pontiac's Bunkie Knudsen recently described the car industry to me.

Naturally, the Big Gamble is centered around the so-called compact cars of the Big Three. Just how big a market this will amount to is what General Motors, Chrysler and Ford would gladly pay several million dollars to know right now. Top brass at GM have told me they figure the market to be between 18-20 per cent of the total new car sales. Some Ford men think it may reach almost 25 per cent. Bill Newberg of Chrysler just says he doesn't know, but adds, "We'll all know a year from now."

The second question is how the small cars of the Big Three will affect imports and how they'll affect Studebaker-Packard's Lark and American Motors' Rambler. Any way it's sliced, these three new entries are bound to cut into the imports, the Rambler and the Lark, unless George Romney's thinking (and it's been excellent up 'til now) is right. Romney feels that the Big Three entries will stimulate the entire small car field to such an extent that he'll sell more Ramblers than ever—and the imports may benefit, too.

The big deal in all camps will depend on how well these small ones

DODGE



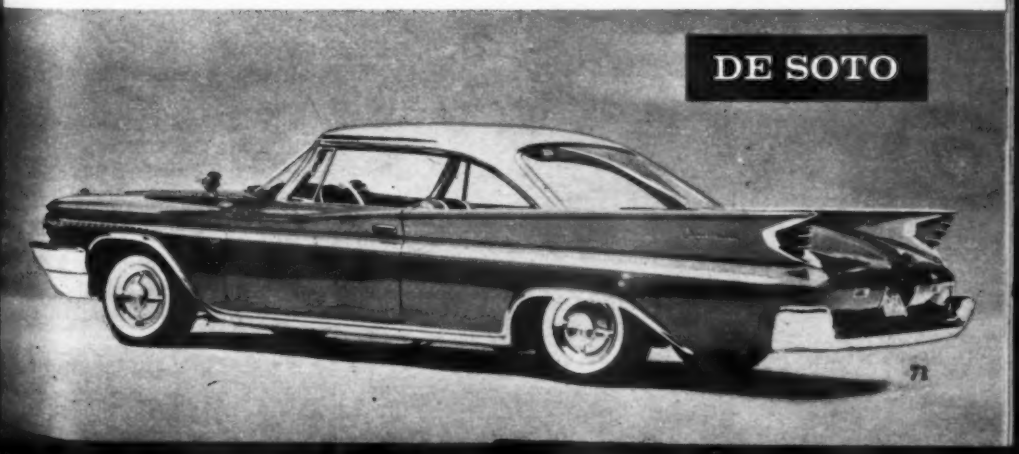
The 1960 Cars

go. The Chevrolet Corvair is covered thoroughly in a test article in this issue, as Falcon was last month. This only leaves the Valiant to be accounted for. The Valiant looks as if it cost several hundred dollars more than either the Corvair or Falcon. Bill Newberg told me personally it would sell at "competitive" prices. When I tried to needle him as to what was "competitive" he said, "The Falcon and Corvair are the competition, naturally." I couldn't get a specific price out of him. In fact, I couldn't get an exact price at this

writing out of the Falcon or the Corvair men, although I was assured by both that it would be "about $2,000." Now, if Newberg *can* match the Falcon and Corvair price tags, he's going to give both these entries one helluva run because the Valiant has more power, more performance and superior looks plus the great Chrysler torsion-bar suspension (which no one has matched yet in this country).

But now let's take a look at what General Motors, Ford, Chrysler, American Motors and Studebaker-Packard have to offer for 1960 in their standard-size lines of cars. Here are the new models, styles and engines you'll be seeing in this exciting automotive year.

GM, top dog in the automotive world, has just completed an excellent year. What's new with its number one dividend-payer, Chevrolet? The 1960 Chevy has gone in for a pretty heavy face-lift which includes knife-edge styling and a modification of its batwing tail. It still comes in three well-



The 1960 Cars

known series: Biscayne, BelAir and Impala, plus three station wagons. The power plants are all similar to those of '59, meaning a Six and two V8s, one displacing 283 cubic inches and the other 348. A high performance "Police Special" will be available on special order in time for Speed Week, if you don't happen to be a cop. Basically the '60 Chevy offers nothing sensationally new. But as you and I know, it will sell in the hundreds of thousands.

Pontiac for 1960 has made the guttiest change of the entire industry. While running miles ahead of all opposition in the medium-price field, and with the best looking cars on the road in 1959, they switched their styling completely for 1960. This took a lot of nerve but they'll get away with it because their 1960 car has top looks, too. In '60 the Pontiac line will be expanded with the addition of an entirely new series—the Ventura. On the price scale the new Pontiacs will start with the lowest cost Catalina, then Ventura, Star Chief and Bonneville. As everyone knows (with the exception of one inmate of the Old Ladies Home), Pontiacs were the performance kings of the nation in 1959 and, as if they needed it, they'll be even a little sharper in 1960.

RAMBLER AMERICAN

Oldsmobile had a great year in '59—one of their best in history. For 1960 they've done some style-jiggling and they've removed that silly chrome strip outside the driver's window. The front hood-line has been reworked and, in my opinion, the style changes they have made have all been to the good. All models have been reduced slightly in overall length. The '60 Olds will be powered by a 394-cubic-inch mill in the 98 and Super 88 series and a 371-inch

twirler in the plain 88. These are good road cars with ample performance for just about every need. Olds should do well in 1960.

Buick had a real bad year in 1959, which is hard to understand because they were the best Buicks ever built. They've been restyled considerably for 1960. It is anyone's guess how they'll sell but I will be very much surprised if dyed-in-the-wool Buick fans will be able to resist them. No ex-Buick owners will ever have owned cars this good. I feel that changing the well-known series names from Roadmaster, Century and Special may have hurt the '59s a great deal. Even experienced auto men had trouble placing the new names: Electra, Invicta and LeSabre. For some old-time Buick men it might have been like a kid trying to get used to Frank Sinatra playing a clean-shaven Santa Claus.

Cadillac, the hottest-selling high-priced car in the world, will undergo no major changes for 1960. The power plant is still the same 390-cubic-inch mill developing 325 or 345 horsepower, depending on model. All are on a standard wheelbase of 130 inches except for the Fleetwood limousine which is slightly shorter than a ferryboat. Regardless, the safest bet in the book is that Cadillac will still outsell all other high-priced cars in 1960.

[*Continued on next page*]

CHEVROLET

RAMBLER

The 1960 Cars

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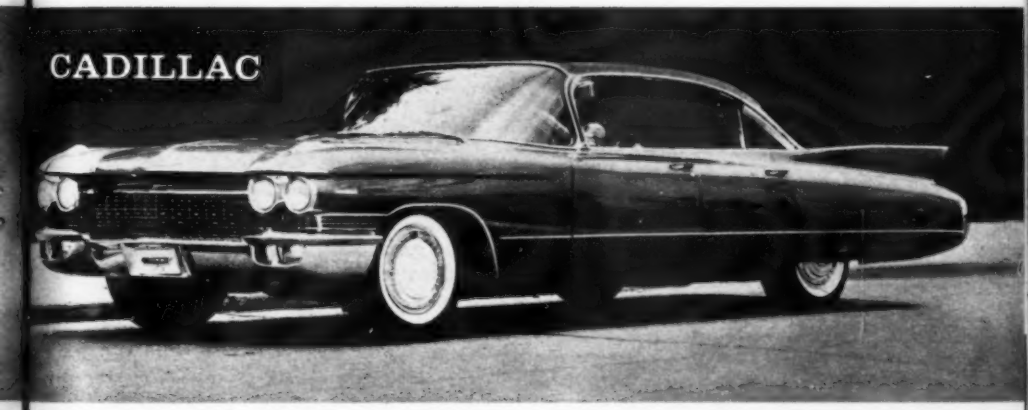
The Ford Motor Company had a real good year in 1959 with the exception of its Lincoln, Mercury and Edsel sales (which is quite an exception, I'll admit). Anyhow, they sold a lot of Fords—and that's what keeps Dearborn, Mich. in grass seed. The 1960's present a complete style change—so much so that if there weren't any Ford labels on them, no established Ford dealer would recognize them as Fords. These are the best-looking Fords to have been built in many a year. The hoodline has been nicely dropped; the tail line is clean and free from distortion, and the profile is the best to come out of Dearborn in some years. This is a good-looking automobile. The power plants of all the Fords will be basically the same as in '59 with one exception which we'll call "The Bomb." This is the Ford with a hopped-up standard-size engine for impatient bird watchers and such. Of course, this rig will be called a "Police" something or other but my private opinion is that it was designed for "giving it a good go," as Bill France might say, on the sands of Daytona. Ford can't miss having another good year.

Mercury, after two or three years of the wildest space age design kick ever foisted on the American public by Detroit, has climbed back into a Brooks Brothers' suit for 1960. Once again it is a tasteful-appearing automobile, with lines slightly similar to the 1960 Oldsmobile. The power plants of the '60 Mercs are, for all practical purposes, identical to 1959. They range in size from 312 cubic inches to an atom-smasher of 430 cubic inches (40 inches larger than a Cadillac, if you'd like a yardstick). From a comfort angle there isn't a more luxurious car made in



Detroit, within its price range, than the Mercury. The bodies are among the best built in this country and among the quietest. The only fault I find with the Mercury is that its automatic transmission eats up just a little too much horsepower and torque but possibly you won't mind this because the car is loaded with other goodies, such as body quietness, that can't be topped at any price.

Edsel, stylewise, comes pretty close to being a Chinese copy of the '59 Pontiac. If Edsel would incorporate some of Pontiac's performance into this design they'd have a helluva car. However, though I haven't tested the new Edsel, there is nothing in the specifications of its Ford-like engines that would indicate bomb qualities.

Lincoln comes in three series—the Continental Mark V, Premiere and plain Lincoln. The styling for 1960 has gone very shoeboxy and appears as square as a Nebraska Congressman. They've replaced the former four-barrel carburetor

The 1960 Cars

FORD

with a two-barrel job this year, which they claim gives better economy and smoother idling. One feature Lincoln has is a new 25-gallon fuel tank. These cars aren't even slightly reminiscent of the great Mexican Road Race Lincolns of just a few short years ago.

HAWK

The Chrysler Corporation would have had a real good year if production hadn't been halted for months by a glass strike. As it was, they made up for lost time after they got going and wound up with a healthy profit.

Plymouth, Chrysler's mainstay, has undergone dozens of changes for 1960, not all of them obvious from the outside. They've switched over to unitized construction—body and frame combined into a single, all-welded structural unit—and the styling has been modified, although not as drastically as on some other cars in the Chrysler line. A Plymouth equipped with the 361 Golden Commando will run the ears off anything in its class as it comes from the showroom. It will outjump any other American car up to 60 mph (with the exception of the Pontiac) and will match the Pontiac down to the tenth of a second. The Plymouth is my choice as the Top Buy in the low-priced field. This year it has a new overhead-valve, six-cylinder engine in addition to the V8s. The Six is mounted 30 degrees from the vertical, a la the Valiant and Dart, a trick they all swiped from Indianapolis. These are the best road and cornering cars in their class.

Dodge has undergone a complete styling and doesn't look any more like Dodges of the past than I look like The Thin Man. The big news at Dodge for 1960 is its new small-size Dart built on a 118-inch wheelbase (same as Plymouth) but slightly shorter in overall length and width. This is a good car and may attract a lot of guys and girls who really don't want a big rig and don't go for a small one. For those on-the-fencers the Dart may be a sharp choice. Personally, I'll be a pretty surprised guy if the Dart doesn't prove to be the hottest-selling kid since General Pershing ran around in a four-cylinder Dodge during World War I.

DeSoto for 1960 has been completely restyled and looks no more like former DeSotos than DeSoto himself did.

LINCOLN

00-00-00

MERCURY

The 1960 Cars

EDSEL

Like the Chrysler line, it has stolen its grille from the Chrysler 300 which was the best-looking in the industry, in my opinion. These are good, rugged automobiles.

The New Yorker is the head boy for the cars that sell under the Chrysler Corporation name. Chryslers also come in the Saratoga and Windsor series. It's my personal bet that the Chrysler New Yorker will go down as the Looks Champ of the industry this year. With its 300 grille and a county-full of swashbuckle and gutsiness I don't see how it can miss with buyers who have any adrenalin left at all. These are big gutty cars with the best suspension and handling in the entire industry. Like all cars in the Chrysler line for 1960 (with the exception of the Imperial), they are featuring unitized construction.

The Imperial is the best car made in America, in my opinion. For 1960 they've jiggled the tail fins so they somewhat resemble recent model Cadillacs. Although I won't give them a plus for this, on the basis of their outstanding performance, sports-car handling and the way they're put together, if you want *the* best car made in America, there is no other choice.

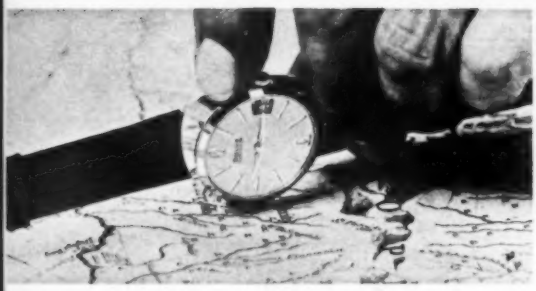
Now let's look at American Motors, the outfit that in 1959 more than doubled the '58 sales of its amazing Rambler.

Rambler for 1960, as in '59, comes in three sizes: 100-inch, 108-inch and 117-inch wheelbases. The [*Continued on page* 186]

THUNDERBIRD

CORVETTE

NOW SEE THIS!



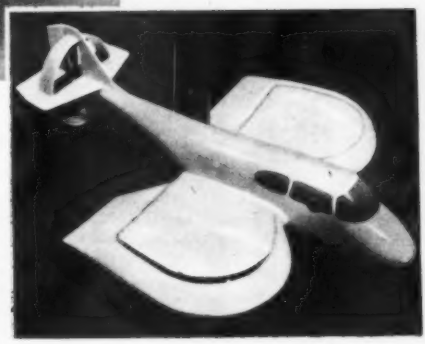
ROLL this strikingly unusual Swiss-made jeweled-lever wristwatch on any standard scale map and you can measure the distance in miles or kilometers. As you roll the watch along the map's highway, the mileage is recorded and seen through an aperture on the face of the dial. The watch is designed for the world traveler, sportsmen or even for the week-end driver who likes to keep track of the distance he travels. Bauble is scheduled for export to the United States sometime within the next year.

NOW you can revitalize your derriere and other cramped muscles while making long-distance drives in your car. The secret is the Auto Seat Vibrator which, it is claimed, stimulates blood circulation with a gentle vibrating action of the entire seat. The vibrator is built into and under the seat and is controlled by a dashboard button. It does not vibrate the rest of the car. $79.50 installed. Available from the Auto Seat Vibrator, Inc., 8851 Park Ave., Bellflower, Calif. It can be installed in any auto, truck, bus.

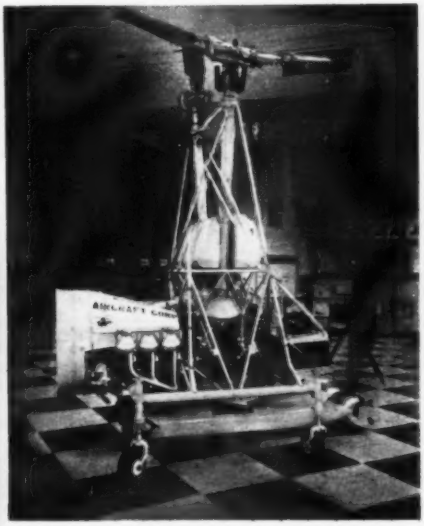
NEW MODEL two-seat Gyro-Glider has no engine. It soars when towed by a car or motorboat and is controlled in the air by an overhead stick, like a full-size helicopter. The craft weighs 98 pounds and totes a 500-pound payload. It takes off at 25 mph and cruises at 35 mph. In a strong wind it can be flown like a kite on a long rope tied to the ground. Kit ($100) and plans ($10) are available from Bensen Aircraft Corp., P. O. Box 2746, Raleigh, N. C. Solo in three hours!

PAPER uniforms are getting tough workout from belly-whopping GIs who dive over log barrier. The disposable paper work garments are being tested by personnel of the Army Quartermaster Corps Field Evaluation Agency on a special obstacle course maintained to test clothing and footwear. The army has no plans to equip its men with paper clothing at the present time. Tests are being made to determine whether paper garments might be feasible for GIs of future.

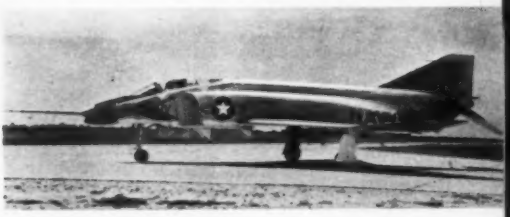
NEW IN THE AIR



VANGUARD 2C is new VTOL (above and at right) with ducted fans in wings, pusher prop in tail. Cruising speed is 165 mph.

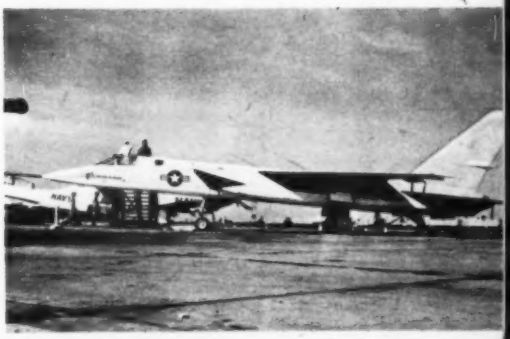


KAMAN DRONE helicopter carries two torpedoes weighing 1,000 lbs. for 110 miles.



McDONNELL F4H-1 is new Navy interceptor with Mach 2 speed. It carries four Sparrow missiles, can deliver nuclear punch.

GLUHAREFF MEG-1X strap-on helicopter has unique counter-balanced, one-bladed rotor using a propane-fueled jet on tip.



NORTH AMERICAN A3J-1 is two-man attack bomber for carriers. It is 70 ft. long, has an unusual bomb bay in the tail section.

HOW RCA IS PLANNING.... YOUR WORLD OF TOMORROW

By James C. G. Conniff

MECHANICAL MAID cleans floor at push of button, returns to niche, readies itself for next job.

SERVING CART rolls to table, loads, scrapes, washes, dries, stores dishes in Miracle Kitchen.

RADIOS as small as sugar cubes. Typewriters that print letters as fast as you can dictate them.

A memory storage plate smaller and thinner than a postage stamp—a shoebox full of them will store and produce any one of a million facts in seconds.

An automated house with electronic devices that awaken you in the morning, make your bed, prepare your breakfast, clean house and make it burglar-proof while you are out.

All of these electronic miracles are in existence. They are products of the David Sarnoff Research Center in Princeton, N. J., and scientists of the Radio Corporation of America are working today to make them available to you tomorrow.

Let's examine the automated house and its amazing Home Electronic Center, which consists of a miniaturized system of all-electronic mechanisms already lab-tested at Princeton. This system will let your wife run her home by push-buttons in a few short years.

For example, with this Home Electronic Center setup your wife will dial the electronic controls the night before to wake you gently to music in the morning. The system will shut the window when you get up or turn up the heat or air conditioning. In the bathroom you'll put your chin into what looks like the lower half of a catcher's mask upholstered in flexible, multi-perforated metal. It is a soundless electronic abrasion shaver which will adapt to the contours of your face for a fast, clean, sting-free shave. Meanwhile your shower is running at your preferred temperature.

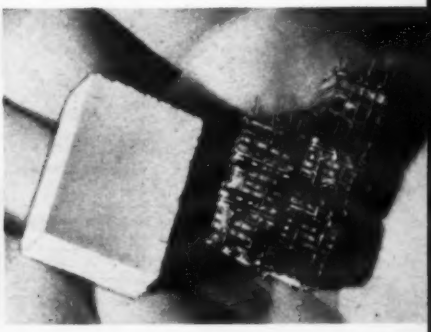
RCA engineers call this wonder system the Home Electronic Center Kid, or HECK. While your wife snoozes on, silent HECK is busy preparing your breakfast—chilled juice, hot coffee, eggs and toast—which will be served by HECK as you approach the kitchen table.

You eat in a room suffused with electronic sunshine, even in the coldest weather. A tilt-up, table-top Telefax reports world news in text and pictures while HECK clears the outside walks of snow via buried heat grids. An electronically-activated servo mechanism opens the garage doors and warms up the car.

When your wife finally gets up, HECK has already done your dishes and tidied up and will do the same for her. While she enjoys a breakfast, HECK silently sorts and washes the laundry, dries it and folds it before dusting the house by electronic precipitation.

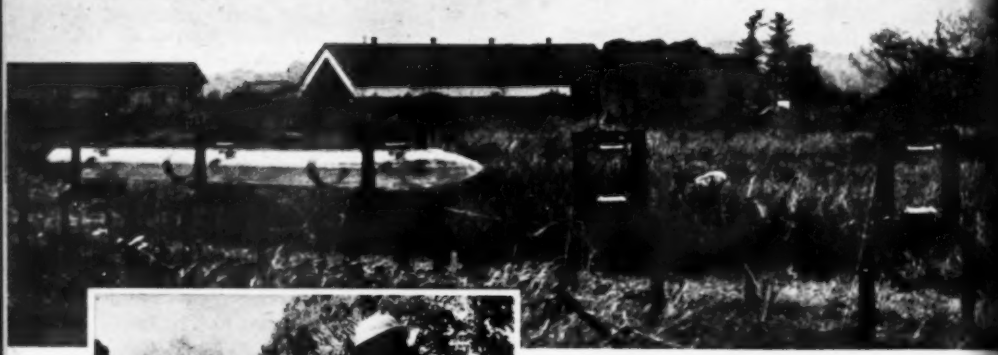
HECK will make the beds and quietly dispose of all garbage via machinery and deep underground tanks. All your wife has to do, besides keeping pantry and freezer loaded, is insert punched menu cards [*Continued on page* 188]

NUVISTOR is new electron tube which fits into thimble. Tiny tube is slated for 1960 production.



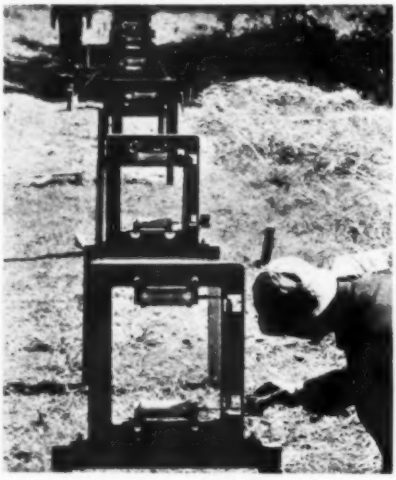
RADIO smaller than sugar cube. Micro-modules compose receiver.

Jap Train Will Do 450 MPH
(They Say!)



PLACING plastic model between the rollers at start. Rocket-like vehicle fits fairly snugly.

PROFESSOR Hisanojo Ozawa of Japan has designed a radically new type of train that he claims will do 450 mph, whizzing by jet propulsion between upper and lower rollers. Recently he tested a model, which did a modest 25 mph but functioned perfectly as a mechanically guided missile. A problem: how do you get around curves? Professor Ozawa has the answer: curve lines of no less than 2.48 miles radius. •



ROLLER FRAMES, steel resting on wooden bases, are spaced four meters apart.

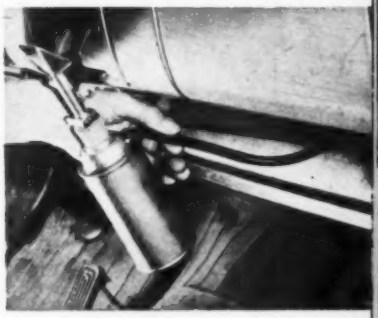
JET ENGINE SMOKES after the brief test. Speed was only 25 mph but test was a success.

BRIGHT IDEA AWARD MECHANIX ILLUSTRATED

POWERED ASHTRAY

YOUR first reaction may be an uncouth yok, but this addition to the power equipment of the modern car has merit. It will appeal especially to that growing army of fussy characters, the new non-smokers whose sense of smell has come back. The foul ashtray odor can be eliminated from your cabriolet with a Zip-Away Power Ash Tray, which sucks smoker's filth into a tight can. Zip-Away allows you to dump burning butts, ash, pipe dottle, matches and other small trash into a dashboard slot, squeeze a trigger, and watch the refuse disappear. Easy to follow instructions for installation in practically any make and model of domestic or imported car are supplied by the maker. The vacuum powered ashtray is $7.95 postpaid from Creative Merchandising, 8845 West Olympic Blvd., Beverly Hills, Calif. The maker is Incigarettor Sales & Mfg. Co., Santa Monica. •

HOSE is spliced into wiper vacuum line with a nylon tee: an extremely simple procedure.



FREE END of hose fits over nipple on container. The unit will hiss as it does its work.

WIN $50

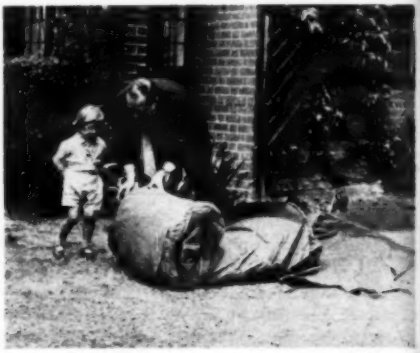
MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

Blow up your own garage

IF you ever meet a guy who claims he blows up his own garage, believe him. He's not full of hot air. The hot air is for use in the inflatable garage he has stowed in the trunk of his car.

This unique Numax inflated hut is made by a Welsh firm, Elliot Equipment Ltd., and is made of a tough rubberized fabric with a nylon cover. Deflated and folded, it is packed in a canvas carrying case with handles. When put to use, the garage is removed from the trunk and unrolled. A small electric blower attached to the battery of the car inflates the shelter in a few minutes.

BLOW-UP garage. When packed in its carrying case, it measures 34x18x12 inches.

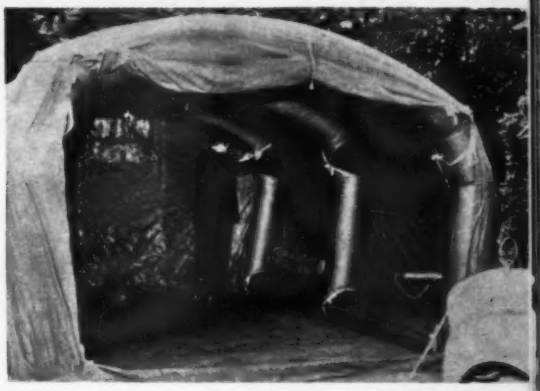


GARAGE is simply hauled out of trunk and unrolled when owner wants to put car away.

WIRES of electric blower are then clipped onto car battery—it takes seconds to do.

BLOWER end is fitted into tube on garage. Shelter is a tough, rubberized material.

THAR she blows! Small electric blower inflates 88-pound garage in a few minutes.



FULL of air, garage measures 12x12 feet. Ceiling height is seven feet six inches.

Large tubes form the main structure inside the garage. They are fitted with special compensating bags to minimize any variation of pressure due to changes in temperature. A clear, flexible plastic window which can be opened is set in the back wall. The door is closed with zip fasteners when the car is in the garage, as in the photo below. The whole rig is designed for stability in high winds and is said to be completely waterproof, even in torrential storms. There are fixtures for light and telephone connections and roof louvers supply ventilation. The garage costs about $428, including the carrying case. •

Hunting and Fishing

JUMP SHOOTING FOR DUCKS

By Wynn Davis

IF you've been spending days in blinds staring at your decoys, hoping in vain for a flock of Canada geese, mallards or butterballs to come and pitch camp within easy range, could be you've been missing something, especially if you're under 40 and in top condition. The thing for you is jump shooting.

Jump shooting is just what the name implies—jumping ducks and then trying to line them up in your sights. You can do this on any river, large stream or flowage between lakes or ponds along any of the flyways, providing ducks use it. A little scouting will quickly put you wise. Once you've found a stream the ducks use, you're off to the races. On good days you'll find plenty of ducks feeding in the pools, while out on the lakes, estuaries and wide rivers the ducks are rafted way out of range of the shore blinds. And you just might run into a bunch of Canadas.

I've even had bang-up sport in mountain country. In the Adirondacks, for example, more than 50 rivers, [*Continued on page* 191]

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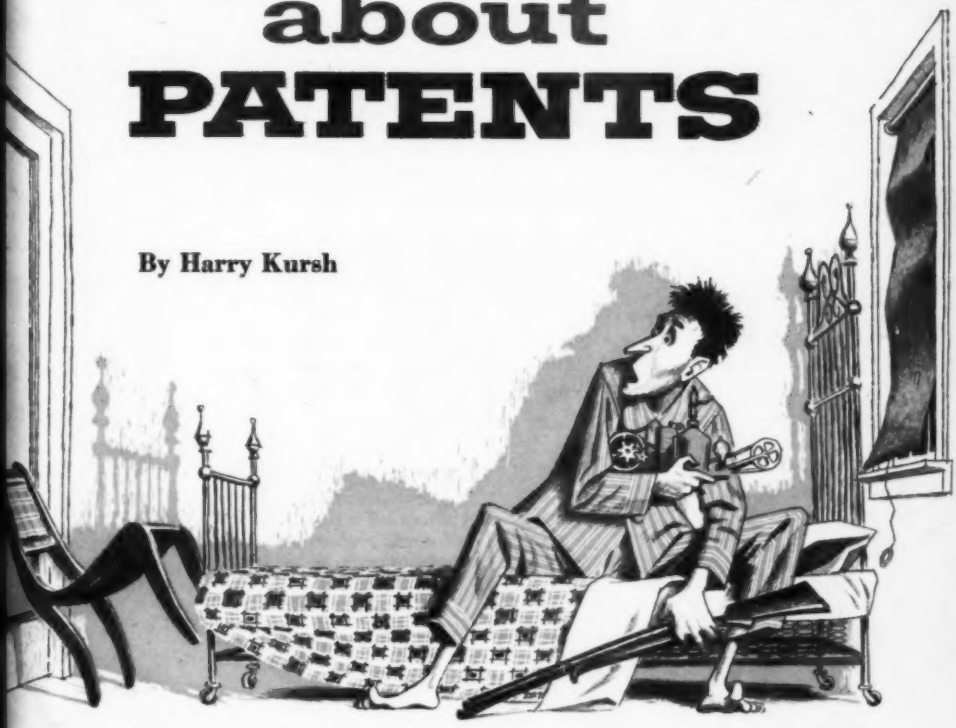
What YOU should know about PATENTS

By Harry Kursh



WORRIED sick about your invention being stolen? Get legal protection with a U.S. Patent.

WHAT is a patent?

It is a "legal monopoly" authorized by the Constitution and granted to inventors by the U. S. Patent Office. It gives inventors the right to exclude others from making or selling their inventions.

How long does a patent last; can it be renewed?

A patent is good for 17 years. It can be renewed only by a special Act of Congress but no patent has ever been renewed in modern times.

What does it cost to get a patent?

You pay the Patent Office $30 when filing your application for a patent and another $30 when and if the patent is granted. An additional $1 is charged for each claim in excess of 20 claims. If you engage a patent attorney, the initial patent search may cost about $25. If your invention is patentable, and the attorney files the necessary papers, takes care of the drawings and follows through on your application until the patent is granted, average legal fees for a relatively uncomplicated patent will total $300-$500.

Can you patent an idea alone?

No. But many people try. For ex-

ample, one man recently demanded a patent for an idea on solving the "coming shortage of graveyards." His idea was to place future corpses in rockets, fire them into space and let them orbit forever. The law says a patentable invention may be "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvements thereof."

Do you need to submit a model with your application for a patent?

Requests for models are rare. But almost anyone who claims a patent for a perpetual motion machine is asked to submit a model. No such patent has ever been issued.

Is it true that you can patent a plant?

Yes. People who can reproduce a new plant—anything from a flower to a tree—can obtain a patent for their efforts. Some plant patents, like the Better Times Rose, have reaped a fortune. You can get plant patent information by writing to the U. S. Patent Office, Washington 25, D. C.

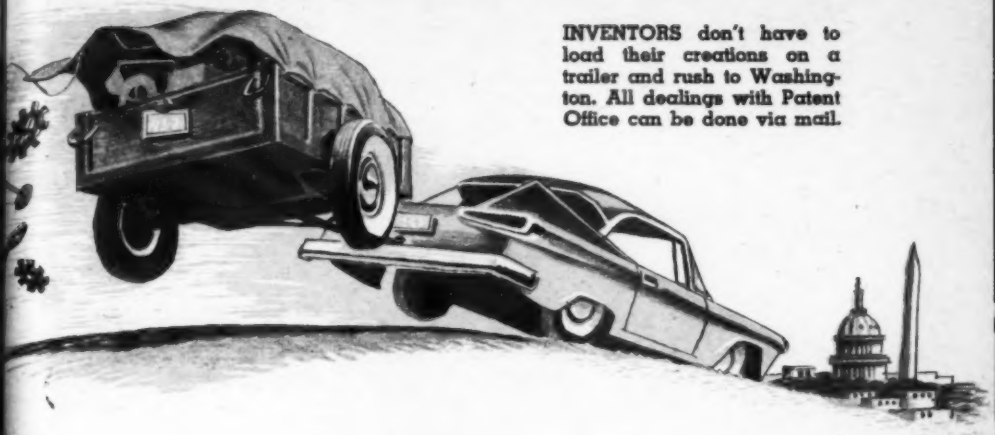
Can anyone get a patent?

Yes. A person of any nationality, citizen or non-citizen, even prisoners, may apply for a patent.

How do you apply for a patent?

You file a written application. Standard specimen applications are published in a booklet called General Information About Patents, which may be purchased for 15 cents from the U. S.

YOU CAN'T patent an idea. One inventor who requested a patent for a plan to place corpses in rockets and then shoot them into orbit for "burial" was turned down.



INVENTORS don't have to load their creations on a trailer and rush to Washington. All dealings with Patent Office can be done via mail.

Government Printing Office, Washington 25, D. C.

Can you file your own application?

Yes. However, it takes a great deal of skill to write a claim that will stand up in court, in the event anyone should try to infringe on your patent. That's why the most experienced inventors use patent attorneys or patent agents.

What is the difference between a patent attorney and patent agent?

A patent attorney is a lawyer who specializes in the field of invention. A patent agent is *not* a lawyer but he is recognized by the Patent Office as a person who is qualified to help inventors obtain patents. In this respect, an agent is just as good as an attorney. However, the agent would be unable to defend your patent in court. Before 1938, anyone who was a recognized patent agent could also call himself a patent attorney, even though he may not have been a lawyer. Such patent attorneys are still in existence, so be sure your patent attorney is also a lawyer if you feel you may need to defend your patent in court.

What if I can't afford a patent lawyer or agent?

The Patent Office will assist you to be sure you have correctly filled in your application and filed everything in proper order.

Can a corporation or business be granted a patent?

A patent is never issued to a business or corporation. Patents are issued to individuals only.

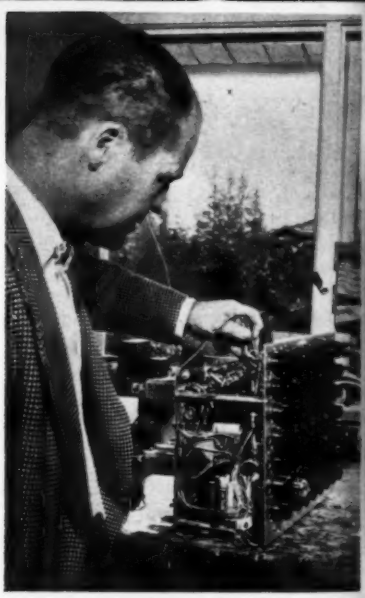
Can you select any lawyer or agent to handle your application?

In a limited way. You may choose the man you want—but he must be registered with the U. S. Patent Office. Any lawyer or patent agent who is not registered cannot [*Continued on page* 193]

YES, Mr. Inventor, you can get a patent for a plant.

MORSE CODE TYPEWRITER

A HEAVY-FISTED ham was Willard Guthoerl—and no one was more aware of it than he. His brutality was spent entirely on his sending key, however; hams from coast to coast and beyond the seas complained of his Morse signals. Instead of trying to improve his fist he built—for seven dollars—an electronic machine that does away with the single sending key. Now he simply presses the typewriter key for, say, F, and the correct dot-dash signal goes out automatically. The new signals are clear and easy to read. A speed of 15 to 75 words per minute is possible, depending on the skill of the sender. Guthoerl hopes to reduce the size of his unit by transistorizing. He works at Sanford Research Institute's computer lab, Menlo Park, Calif. •



CIRCUIT CHECKING: no one but inventor Guthoerl knows the workings of the Mill-Keyer—and he's not talking. Guthoerl is working on a transistorized model and a memory circuit that would let him tap keys instead of holding each one until signal is complete.

NOW SEE THIS!

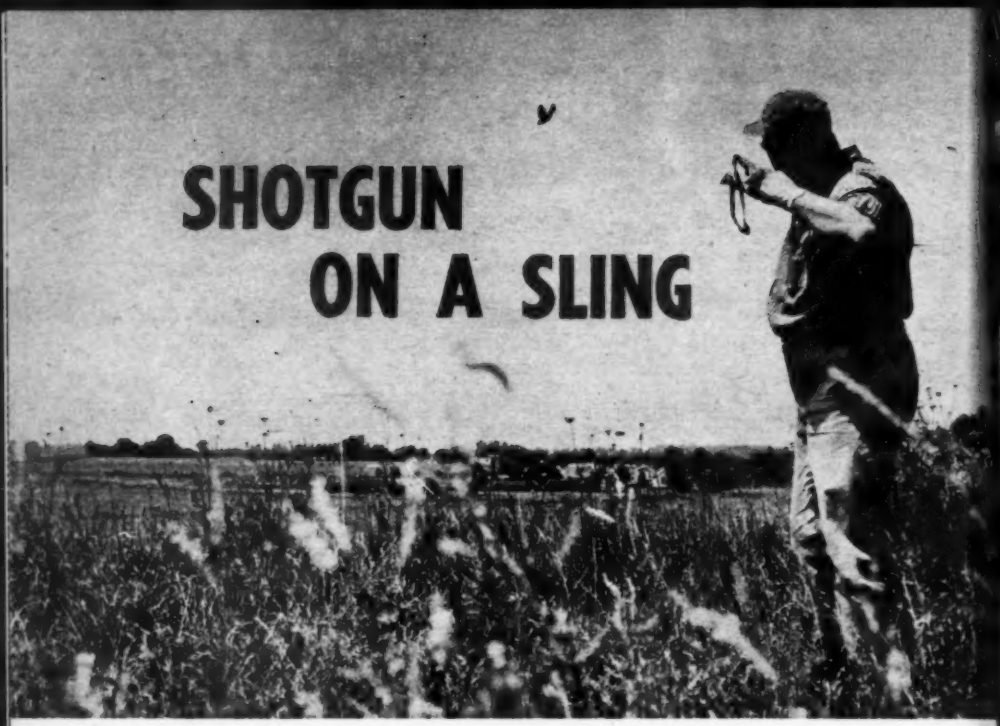
QUIET EAR is designed for use wherever noise becomes a nuisance or a hindrance. The lightweight, sanitary and inexpensive ear protector can be effectively used in bio-acoustic testing laboratories, at jet airfields, artillery and missile launching sites or any place where noise is rampant. Quiet Ear was developed by RCA. Distributor is Bausch & Lomb Optical Co.

FLETCH LOK is a new type of arrow that features slip-in feathers. The purpose of this slip-in feature is to allow the enthusiast to quickly replace damaged feathers without the use of special jigs or tools. Feathers slip into precision-located slots compressed into the cedar shaft of the Fletch Lok arrow. Once the feathers are in position, all that has to be done is to glue the nock into position. Fletch Lok arrows are distributed by the Wyandotte Archery Co., Wyandotte, Mich. You can also order individual components or one of three kits—arrows completely finished; an economy kit of only partially-finished arrows; and a do-it-yourself kit.

DEXON "DRAGON" designed for youngsters has unitized, cast aluminum body, bucket seats. Dragon can carry loads up to 400 pounds. It comes in four models and can be powered by two or four-cycle Briggs and Stratton, Clinton or most standard-make engines. Car is 66 inches long, 36 inches wide. It has non-slip foot brake, finger-grip wheel and pneumatic tires. Accessories are available. Dexon Mfg. Co., Minneapolis.

BABY FERRARI is 97-pound miniature of famous racer. It runs on 12-volt battery which has built-in charger that plugs into 110-volt outlet. Car is 66 inches long, has 40-inch wheelbase and fiberglass body. It also has gearshift, brakes, accelerator, sealed beam headlights, horn. Price: $399.95 without battery. Colors: red, blue, ivory. Gerald Colombi Enterprises, 104 Grand Ave., S. San Francisco, Calif. Interior is leatherette.

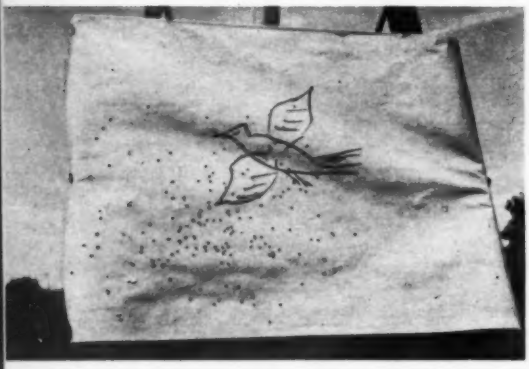
SHOTGUN ON A SLING



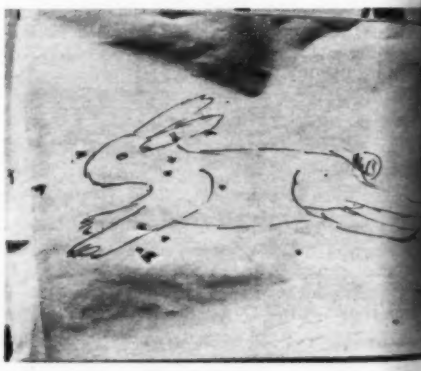
PLUMMETING bird was felled from powerful slingshot blast at distance of about 50 feet.

DEADLY is the best way to describe the new slingshot that catapults its shot in a manner similar to that of a shotgun. It is designed to kill birds and other small game. Price: about $3.25.

Invented by David K. Appleby of New Castle, Del., the slingshot has an aluminum fork. But the most striking part of this new killer is the unique molded neoprene pouch. It permits the user to control the grouping of one or many small pellets of all sizes with great effectiveness. The total number of shot contained in the pouch can be consist-



FINE SHOT—over 100 pellets—made close-knit pattern on target at 50-foot range.



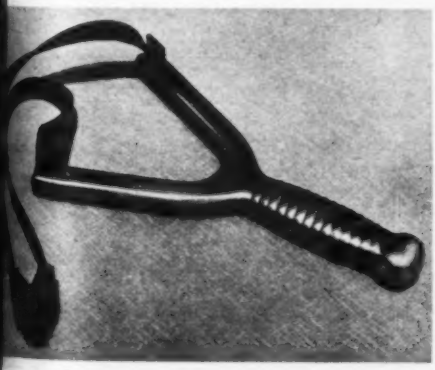
HEAVY SHOT—eight to ten pellets—is used to bring down larger game, like rabbits.

SLINGSHOT is loaded with fine shot from a plastic container which stores ammunition.

POUCH holds up to 150 fine shot. It all arrives at target like a shotgun blast.

ently placed within a 14-inch circle at 50 feet, it is claimed, all the shot striking the target simultaneously, like a shotgun blast.

The pouch design also prevents loss of the shot while the sling is being cocked for release, by completely sealing the shot within it until it is fired. The new slingshot makes it easy to hit a moving target. It kills by shock and penetration of the pellets. •



WEAPON has an aluminum fork and a molded neoprene pouch, elastic latex bands.

SPECIAL pouch design prevents the loss of any shot before lethal killer is fired.

IT'S NEW

ORBITING at fixed 22,000-mile altitude, four manned space stations like this one may ultimately link all of the world's major cities with live television and microwave radio communications, according to RCA engineers.

DARKNESS is no obstacle with army's new infrared binoculars. They enable men to work, drive over roughest terrain in total darkness.

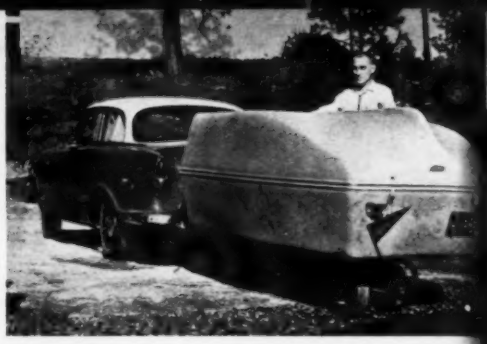
PILLOW water-walkers consist of four inflated rubber tubes connected by boards which hold feet. German-made.

ROLL-OUT TV has wooden top from which tea-lovers can be served. Lightweight car rides on rubber wheels.

"HUCKLEBERRY" river boat was built in a year by Robert Peterson and sons, Charles and Clifford of Chicago. They cruised Illinois River.

RESUSCITATOR, three inches long with thimble for mask, is world's smallest. It can even revive parakeet but is designed for newborn babes.

MODEL of Ford future tractor has TV, weather forecaster, phone, refrigerator, food warmer and a coffee maker.

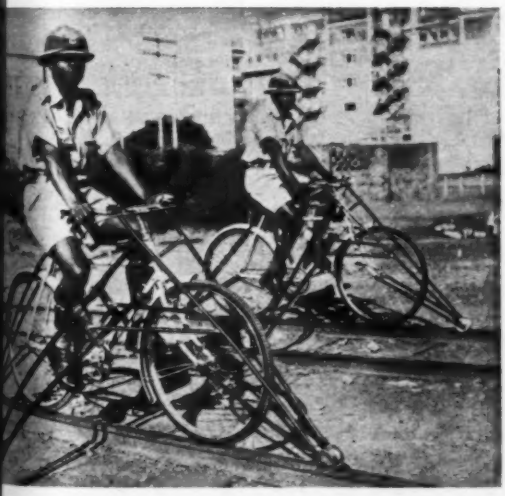


BOAT-CAMPER-TRAILER. Thirteen-foot fiber glass boat folds up to 77-inch trailer, is put in water by removing wheels, unfolding hull sections. Aluminum rods hold sections apart to sleep two in 200-pound rig. Aqua Trailers, Inc., Spokane, Wash. Price: $695.

MITY-LITE flashlight (arrow) floats and can be used underwater. Plastic case is corrosion, damage resistant. Light can be hand-carried, worn at neck, etc., by cord.

INFLATABLE MARKER for helicopter landing sites is being tested by U.S. Marines. It can also be used as emergency marker for mountaineers, rangers or sailors at sea.

JABBO the robot can walk, lift his arms, turn his head, give a canned speech and make his eyes light up. He won first prize for his master, Robin Chandler of Salisbury, N. C., at the South Piedmont Science Fair. Jabbo was created from spare parts in 160 hours.



RAIL BIKES used by North Rhodesian patrols are braced with steel tubing to keep bikes upright, steering rigid. Extended arm with flange rollers grips the opposite rail. Pedal, men!

ADJUST-A-BED plugs into clock-radio and awakens sleeper by raising him to sitting position when timer turns on radio. Simmons bed adjusts to variety of positions.

MONEY MAKING IDEA

THEY INVENTED A NEW HAT

By Bob Willett

TWO University of Southern California lads named Bob Tierney and Tom Morey started out to create a super surfboard of glass fiber and honeycomb paper—a heavier version of the kind used to make those Christmas bells. The surfboard broke in two, but they still had a lot of the honeycomb to play with. One day a friend took a disc of it, pulled it down over his head. *Pouf!* An amusing hat.

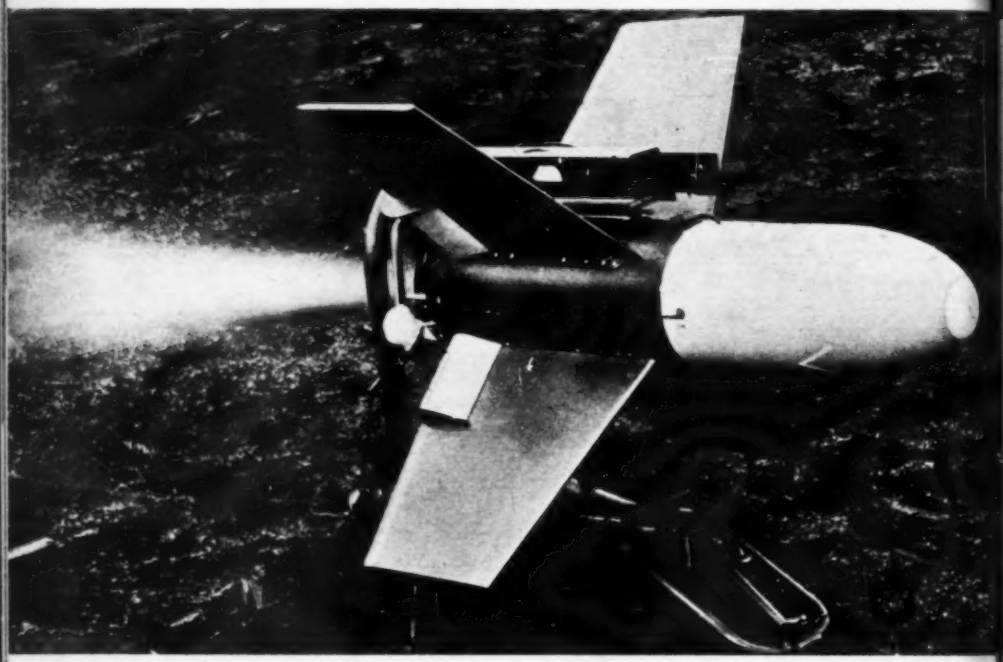
The paper was a [*Continued on page* 190]

INSTANT MILLINERY: an armload of Fantoppers means all the hats, functional or chic, that a girl can want—it says here. A twist of the wrist does it.

MIMI

MIMI's got a couple of swell lines for fishermen this month—a custom float ($18.95) and accessory paddle pushers ($8.95). You sit in the float, which holds up to 250 pounds, reeling 'em in and "walk" via the paddle pushers—little fins that buckle to your heels. Fishmaster Mfg. Co., 1215 N. Kentucky Ave., Oklahoma City, Okla.

Amazing TANK-KILLER never misses



ELECTRONIC missile has removable warhead and can carry any type of explosive.

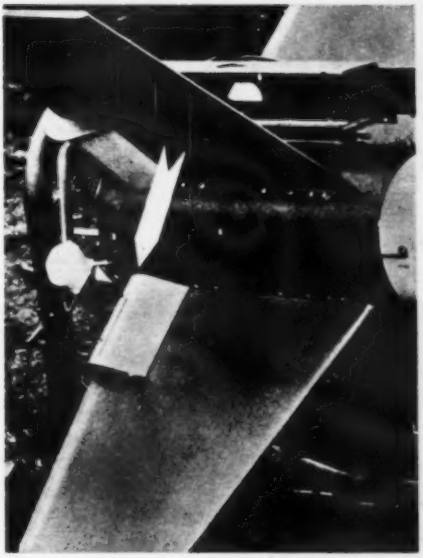
MISSILE is connected by wire to command post. One battery consists of 18 killers.

NATO forces are rapidly being equipped with an electronic missile that may make tanks obsolete—it never misses the target! The tank-killer travels 90 feet per second and has an effective range of 1,500 yards. Steered from a command post by a small, airplane-type joystick, the SS11 can be curved over hills, around corners and through trees to seek out enemy tanks. Tests have shown that it can pierce 14-inch armor and an improved model is under development. •

PUSHBUTTON command post. Number of missile to be fired is selected on dial unit.

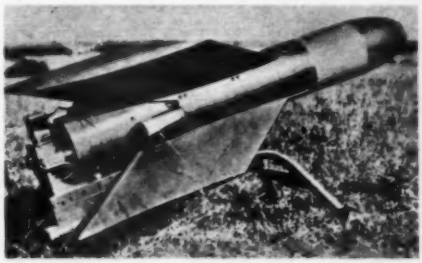
WHOOSH! Missile (arrow) can turn corners and go around obstacles to blast target.

OBSERVER with binoculars follows flight and guides the missile via small joystick.



ARROW points to movable electronic flaps that steer missile. Joystick works them.

14-INCH armor plates from German battleship Tirpitz were pierced like tin plates.

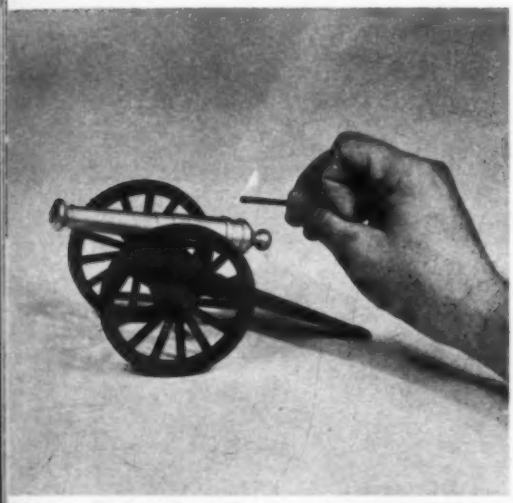


IMPROVED model of tank-killer will be used by Uncle Sam's anti-tank units in Germany.

NOW SEE THIS!

VACUUM CLEANER that picks up leaves, grass clippings, twigs, paper and other trash has been developed by Musgrave, Inc., 2755 Columbus Ave., Springfield, Ohio. The jumbo cleaner can be used on any firm surface—lawns, patios, driveways, walks, garage floors. Four-cycle gas engine drives an enclosed impeller which creates suction.

NEW GAS MASK has no canister or hose, affords protection against inhalation of all known chemical, biological and radiological particles and germs including the new "happy gases." New mask, designated the M-17, is modeled above by Pvt. Raymond P. Gries of the Army Chemical Center, Edgewood Arsenal, Md., where the device was developed.



CIVIL WAR CANNON model that will fire a charge of powder is now available for $6.95. A model of the Napoleon 12-pounder smoothbore field gun, its carriage and wheels are aluminum. The brass-colored barrel will not tarnish. Sold by C & J Sales, Dept. 47, 45 Chafford, St. Louis 17, Missouri.

ON THE HOUSE, in your room—a free cup that wakes you up. A San Diego firm forecasts that these "courtesy coffee" servers will be in hotel and motel bedrooms across the nation before too long. While still half asleep—and not looking much like our model—you mix your cup of instant java.

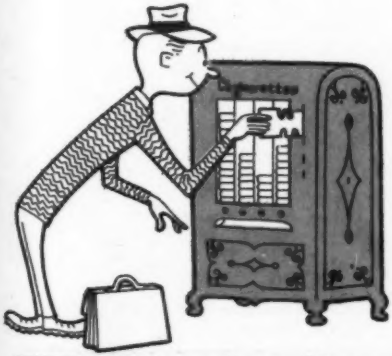
POP-UP TOASTER built into top of electric range would end bother of separate appliance. R. Desrosiers, Methuen, Mass.

BEACH BALL that glows in the dark would enable beach enthusiasts to frolic after sunset. Bill Mittelstadt, Portland, Ore.

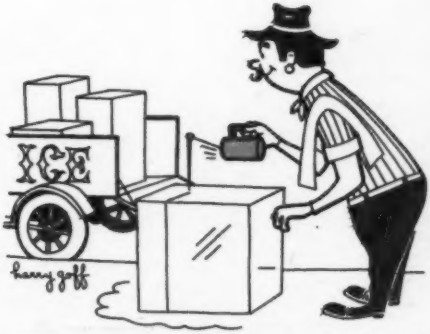
DRAIN around floor of kitchen, bathroom or any tiled surface would make mopping easy. Mrs. T. McCurdy, Springfield, Ill.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N.Y. 36, N.Y. Each one printed will be awarded $5.



CREDIT CARD for vending machines would allow cashless buying. Bills would then be mailed. Malcolm McConahy, Minneapolis.



ICE PICK, battery-powered, would make life easy for iceman and homeowners with iced walks. D. Villaverde, Glendale, Ariz.

These SKIMMERS Go Anywhere

UP IN AIR. Experimental Piasecki Sky-Car travels over highway on wheels, flies over land and water with 425-hp gas turbine engine.

JET FUEL is used to power the Sky-Car which combines the advantages of a land Jeep with those of a small helicopter, claims Piasecki.

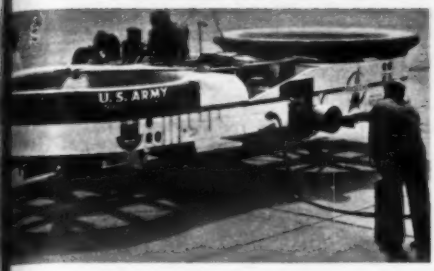
THE Wright boys would blink in astonishment at some of the weird rigs taking to the air these days. Air-Cars, Sky-Boats, Flying Jeeps, Hovercraft—they're revolutionizing the Age of Flight.

Most of these craft are based on two new devices: the ducted fan and the air cushion.

The ducted fan is simply a horizontal prop that supports the vehicle on a column of air. Forward movement is provided by slanted vanes.

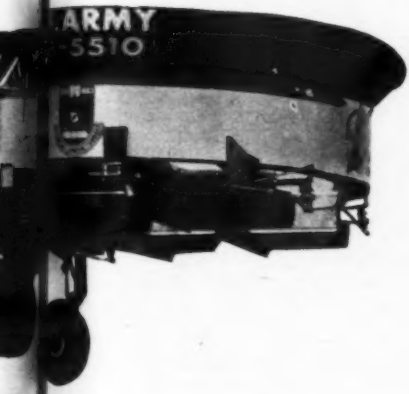
With the air cushion, air under pressure is forced downward, raising the vehicle a few inches above the ground or water.

Here are a few of the latest skimmers to come off the drawing boards. •

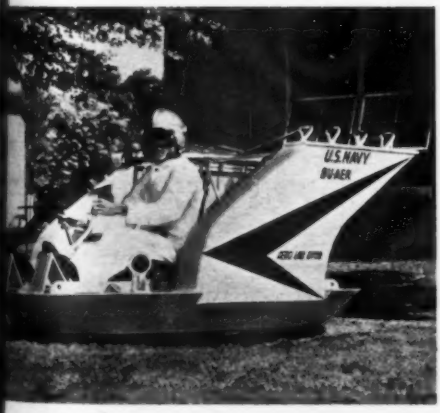


SKY-CAR has flown at 30 feet. Ultimate aim is to have craft achieve 150 mph speed in air, 30-40 mph as a wheeled land vehicle.

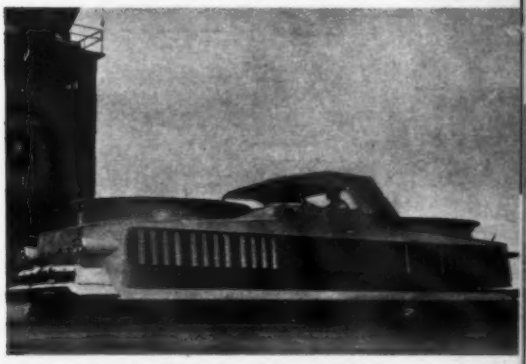
EXPERIMENTAL skimmer developed by the Curtiss-Wright Corp. can use conventional type piston engine of from 50 to 200 hp.



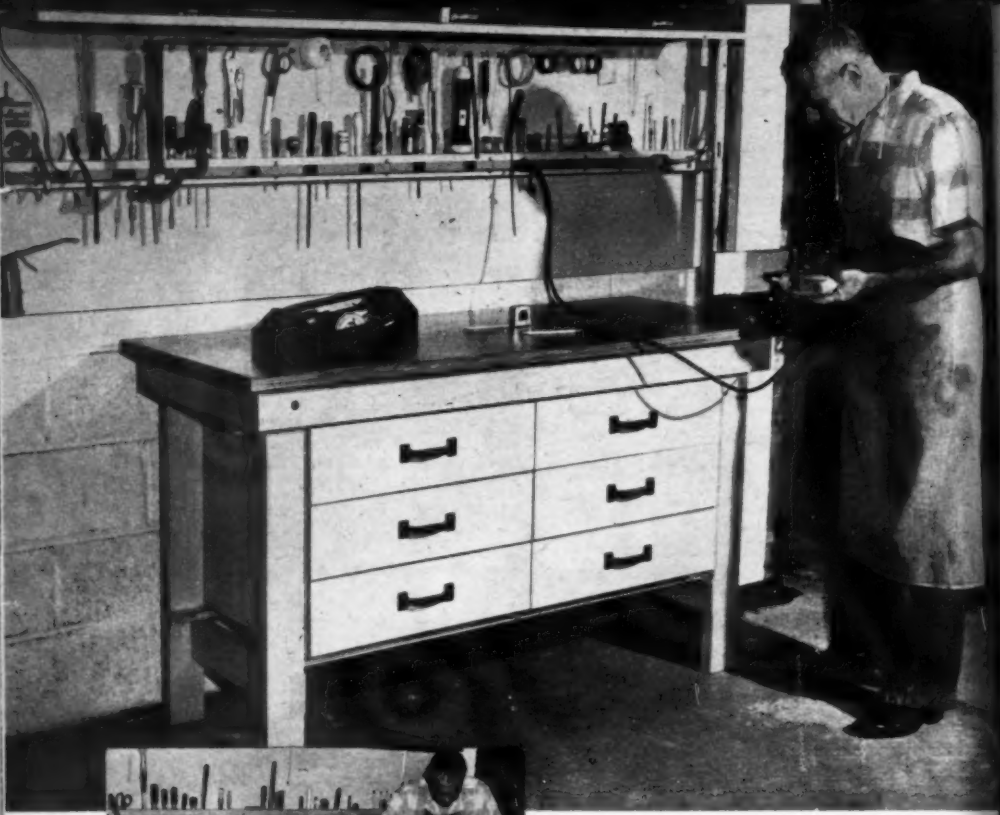
AIR-CAR lifts itself from 6 to 12 inches off the ground. The Curtiss-Wright prototype model can travel in any direction.



SKIMMER is U.S. Navy test job that rides on an inch-thick cushion of compressed air delivered via flexible hose along sides.



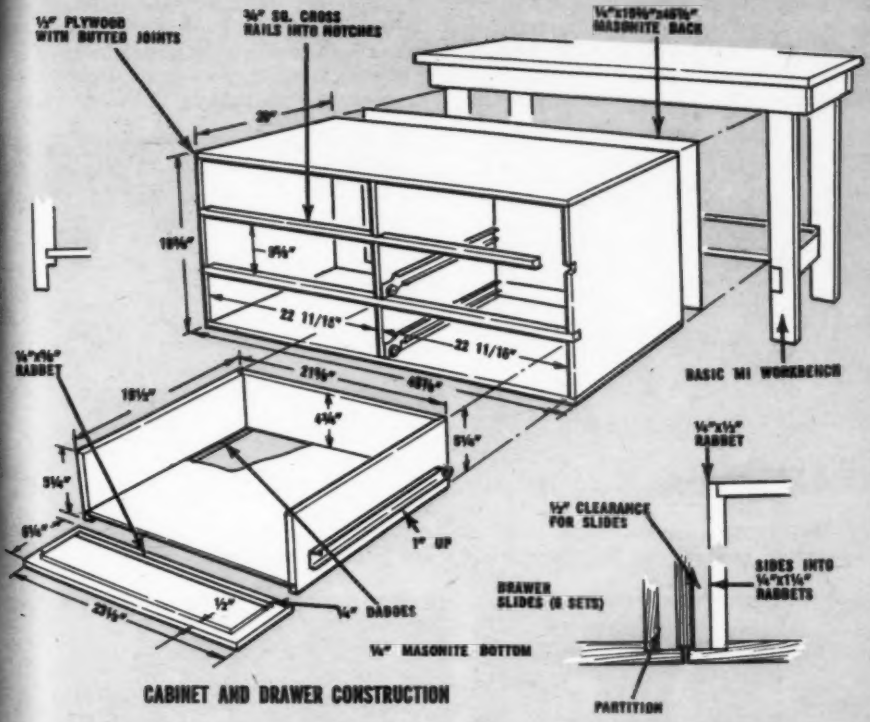
NEW MODEL four-passenger, 300 hp Air-Car is scheduled to go into production this fall at Curtis-Wright South Bend plant.



MI'S COMPLETED WORKBENCH is shown above. It has six roomy drawers that roll on nylon bearings. At left, without drawers.

HOW TO BUILD THE MI WORKBENCH

A large-size plan detailing the construction of MI's Workbench is available. To get your copy send 50 cents to Mechanix Illustrated Plans Service, Fawcett Bldg., Greenwich, Conn. Please ask for Plan No. WB-1 MI's Workbench when ordering the plans.



CABINET AND DRAWER CONSTRUCTION

USE THREE-INCH roundhead screws to secure the two 2x4 cross pieces to the legs.

NEXT drill clearance holes part way into the two 57-inch 2x4's and screw to top.

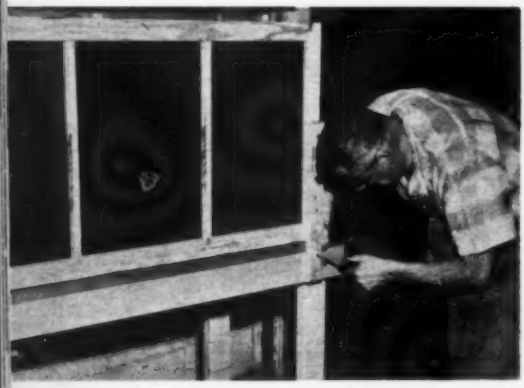
HERE'S a real honest to goodness workbench with nary a gimmick in its construction. It is plainly constructed of 2x4's, has a laminated top and uses plywood for the drawer section. The construction of this workbench is divided into two parts. The first is the workbench proper, the second is the self-contained drawer unit which can be built and installed after you have finished the construction of the workbench.

First step in making this workbench is to construct the ¼x24x60-inch lami-

nated top. The core consists of a sheet of ¾-inch plywood with quarter-inch hardboard glued to the top and the bottom of the core. A good method of "clamping" the pieces together while the glue sets is to set the sandwich on a bed of clean newspapers and then place sufficient weights, such as bags of cement, buckets of coal, sand or what-have-you over the top surface. Make

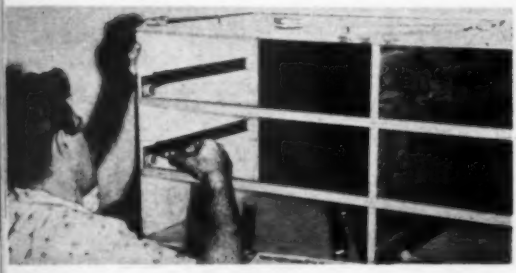
USE ¼x4-INCH carriage bolts, one in each corner, to secure legs as shown.

INSTALL the shelf if you are planning to build the workbench without drawers.

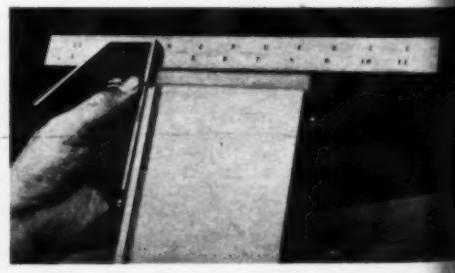


TWO 18-INCH CLEATS, one on each side, hold the optional tool board in place.

TO HOLD the drawer cabinet, two steel angle bars are installed to span the legs.



ROLLER BEARING drawer slides will support the weight of the tool-filled drawers.



USE A TRAY SQUARE to mark off and check dado cuts required in drawer construction.

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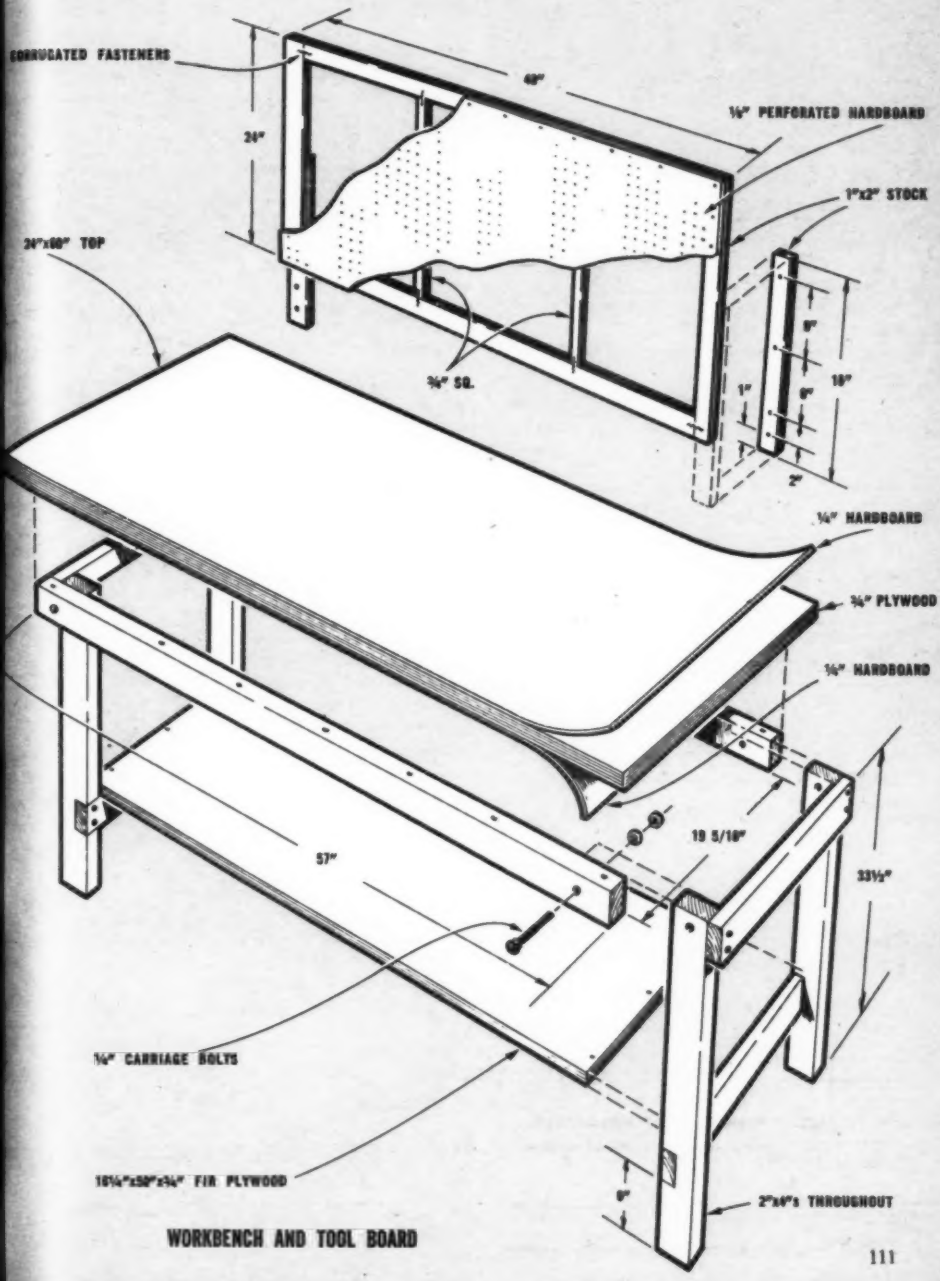
CORRUGA

24"x8

sure that the weight is evenly distributed and let dry for at least 48 hours.

While the top is drying, you can start construction of the framework and the legs. Each pair of legs is made out of four 2x4's with the lower cross member dadoed into the legs as shown in the drawing. The upper member is not dadoed.

Next, cut the two long pieces for the



WORKBENCH AND TOOL BOARD

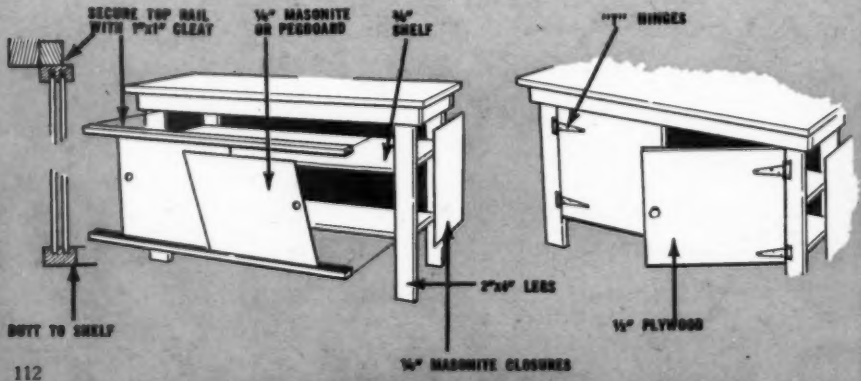
BALL-BEARING DRAWER GLIDE being fitted to the drawer; mating part is on cabinet.

INSTALLING the handles for the drawers. Note the plug-in strip above workbench.

DRAWERS are especially roomy and easily hold a tote box full of tools as shown.

upper frame of the table. These are also made out of 2x4's, each one (you'll need two) is 57 inches long. Drill five equally spaced holes part way through each 2x4. These holes should be wide enough to pass the head of No. 10, three-inch roundhead wood screws which will be used to secure the top to the upper framework. Drill these clearance holes only halfway through the 2x4's. The balance of the hole should only be a pilot hole. This way the heads of the screws will be recessed and you will be able to use shorter screws.

After the legs have been assembled, the framework secured to the top (all of this work should be done with the work in an upside-down position as shown in the photos), you are now ready to attach the [*Continued on page* 162]



WORKBENCH CAN ALSO BE BUILT WITH TWO SLIDING DOORS OR TWO HINGED DOORS

WORKSHOP HINTS

PLASTIC pill bottle with slit in top protects glass cutter which is kept in kerosene bath.

MAKE a sanding block by gluing felt base to piece of wood. Sandpaper is bonded to felt with rubber cement, peels easily.

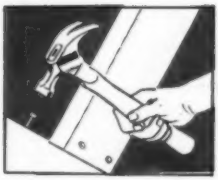
DON'T HUNT for the particular scale you are using every time you pick up the triangular ruler; use clip as a marker.

DOOR STOPS fastened to the bottom of a drawing board will tilt it to comfortable working position and keep it from sliding.

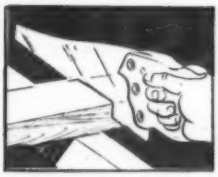
AN EXPERT* SELECTS . . .

the Golden Dozen

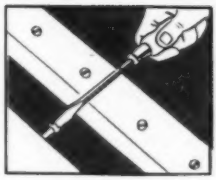
A careful selection of the twelve basic tools with which to start your workshop.



A good claw hammer—one with balance, weight, and a grip that is comfortable—should be the first tool selection. A hammer with a 16-ounce head is an excellent choice as it is heavy enough to do rugged work. The better tool manufacturers are now making hammers with heads that will not loosen from the handles. Some brands feature a one-piece construction with handle and head forged from a single piece of steel. The handle part consists of either molded rubber or leather shaped to fit the hand. Whatever kind you get, make sure it is of the best quality. About $4 buys one.

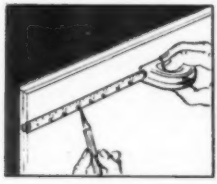


The hand saw should be your next selection. Most of the work to be done with this tool will be to cut across the grain of wood. It will probably be used more for finishing than for rough work. So, a taper ground saw, 24 or 26 inches long with 10 teeth per inch is the ticket. If you are planning to do much ripping (this is cutting a long board with the grain) a 26-inch rip saw, with five teeth per inch, is recommended. Such a saw will cut rapidly, leaving a rough edge that can be and should be planed smooth. You'll get a good saw by buying a name brand; $9 or so puts you in business.



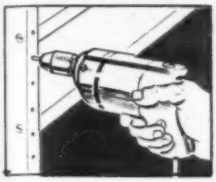
Third choice is a good selection of screwdrivers. A top quality set of five should consist of a stubby; vest pocket; four-inch; Phillips, and a six-inch. Get the kind with shock-proof handles and, needless to say, don't use them as chisels or crowbars. A good mechanic always selects a screwdriver that exactly fits the slot of the screw to be driven. Screwdrivers are the least expensive of all tools—all the more reason to buy the best. $3 for a good set is a long time investment.

A good pair of pliers is essential in any tool kit. The type that is best for all-around use is an eight-inch, slip-joint plier. A plier should not be used as a pipe wrench as it will chew up the work. Always remember, a pair of pliers is a holding tool, not a turning tool. A good quality plier will have jaws of hardened steel to prevent wear. Check this point before making your purchase. About $2 will start your collection.



An important tool that does no apparent work is a measuring device. Get a steel tape for this job. While you're at it, you may as well get a ten-foot tape instead of the common six-foot variety. These handy tools come in a metal case into which the steel tape recoils. Some models have a locking device to "hold" a measurement and most of them can be used for inside measurement by adding the width of the case, generally two inches, to the figure. It's $2 well spent.

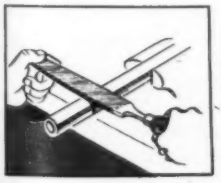
*Our expert, Clarence Martin, has been a workshop instructor for 29 years.



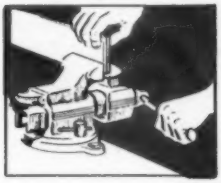
The quarter-inch electric drill is the little workhorse of the shop. It can safely drill up to its size in metal and will cut a one-inch hole in wood. Get the kind with a geared chuck and a pistol handle. Look at the name plate: generally the higher the ampere rating, the huskier the motor. Prices range from about $15 for the light-duty model to about $45 for a heavy-duty job. It will be your pet tool.

It's impossible to make a decent electrical splice without a soldering iron or gun. The popular gun type has much to recommend it. It heats up quickly and has a better heft than the old-style iron. Whichever type you select, make sure it is of sufficient capacity to solder No. 12 gage BX wires. Some of the new irons are now supplied with a grounding cap. About $7 for the gun type.

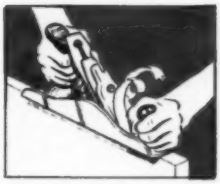
A wrench is next on our list. The Stillson is used for work on round stock or pipe while the Crescent or a monkey wrench should be used on nuts or bolt heads. These wrenches are adjustable and will handle 90 per cent of the "wrenching" around the house. A good one to buy is the ten-inch size. Oil the moving parts occasionally and keep the jaws clean. A wrench in either style, of excellent quality, will cost you less than $5.



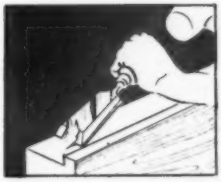
Rough edges, like relatives, always crop up. The tool for smoothing a rough edge or surface is a file. Best bet is a ten-inch half-round file which will give you two working surfaces, a flat and a round one. Don't forget to get a wood handle for the file. It's much easier to control the cut if your file has a comfortable grip. Wood rasps for removing wood are also part of the file family. A dollar bill will get you a file.



A vise, essential for holding the work. Get a sturdy one with 3½ or 4-inch jaws. The jaw bottoms should be shaped to accept round stock and pipe. Base should have a built-in locking swivel so the vise can be rotated when handling extra long boards. Always mount the vise so that long vertical work will clear the workbench edge. About $18 buys one. Handiest tool in the shop.



A plane is a hand tool that is used for smoothing wood or to shave down its surface to a desired size. A junior jack plane (11½-inch) is a good size for a first purchase. It's long enough to insure a true, straight cut and yet short enough to be used at an angle to shear off end grain. Learn how to adjust your plane, always keep it sharp. About $11. Block planes are small one-hand tools with a shallow cutting angle; about $4 for these.



A chisel is always needed for an endless variety of cutting jobs such as installing hinges, cabinet joints, and removing surplus wood that cannot be reached with a plane. A set of four (¼, ½, ¾ and one inch) is a good purchase. If you want to buy only one, make it the half-inch size. Comparatively new on the market are all-steel chisels for finishing or ripping. A set of four chisels ranges in price from approximately $3 to $9. Always keep chisels in a sheath.

PLANNING YOUR HOME WORKSHOP

The well-organized workshop is an inspiration for fine craftsmanship.

WITH a little forethought, you can create a workshop which is a pleasant and efficient place to pursue your hobby rather than a jungle in which you have to strive to produce anything. And your first thought should be to the location.

Most home workshops are located in the basement—and this works out very well from a practical standpoint. It's right where you have the heating, electrical and other facilities of the home at your disposal and there's generally ample space. For economy, comfort and convenience, it's hard to beat. But there are other places where you can build a fine workshop and any one may be best suited to your needs.

The garage houses many a shop. There's good light and ventilation, noises are easily isolated from the house and it's handy for exterior work and repair. If you have a two-car garage, one half will make an ideal shop. Then you

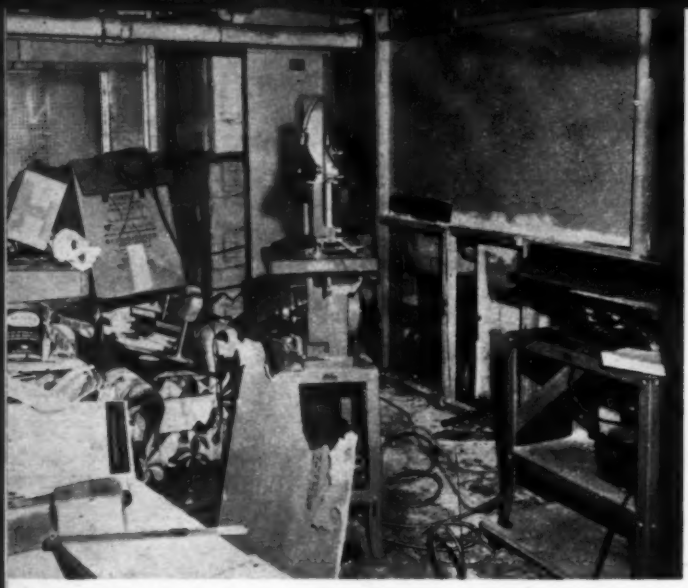
THESE TWO VIEWS show the trim, well-designed workshop of John and Ro Capotosto. Note the use of casters on the power tool stands.

can also use a spare room in the house with most of the advantages you have in the cellar. Another answer is to build a special wing onto the house or a separate house entirely, though this involves additional expense which you may not be prepared to take on. Without these preferred locations, some people build a shop in the attic. Here, however, the floor must be quite strong to support the equipment and you also have to deal with deadening the sound and vibration which will be transmitted to other parts of the house. Then too, there may be a problem in bringing in supplies and equipment and in taking out finished products. But the main point is to select a location which will give you all or most of the natural advantages without too much work and expense.

An example of good workshop planning is shown in our photographs. In a cellar area of 14x16 feet, there is a large bay of storage shelves, a wall rack, book shelves, two peg-board tool racks, two workbenches, a band saw, circular saw, jig saw, drill press, shaper, lathe, jointer and a sander-grinder. With everything neatly arranged, there's still plenty of room to work.

In building the shop, a major part of the work involved relocating a maze of water pipes and BX cable which criss-crossed the entire ceiling. For neatness, all were moved into two outlying spaces between the joists and covered over with plaster board. The other recesses between the joists were retained, but furred in and faced with plaster board so that surface-mounted fluorescent light fixtures could be installed in them. There are a total of nine units wired to three switches so all need not be used at the same time; when they are, they provide excellent illumination over the entire shop.

Near the entrance to the basement were two lally columns and one of them



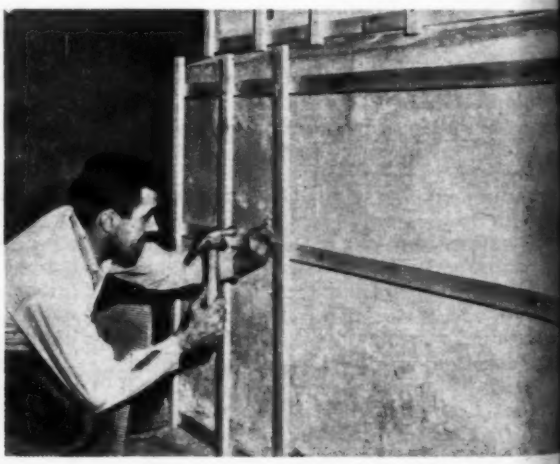
AT THIS STAGE your dream workshop may seem very far away, but things go fast once you get the ball rolling.

REMOVING insulation from pipes for more heat in shop.

was moved about four feet to provide a suitable space for a workbench. The procedure for moving such a column involves four steps: dig a hole and pour a new footing, take the weight off the column with the aid of timber and wedges, relocate the column and then release the weight of the girder. The other lally column near the stairway was boxed in to form one side of a book shelf which extends to the entrance archway. The lower half, left unshelved, makes a cozy nook for the wood shaper.

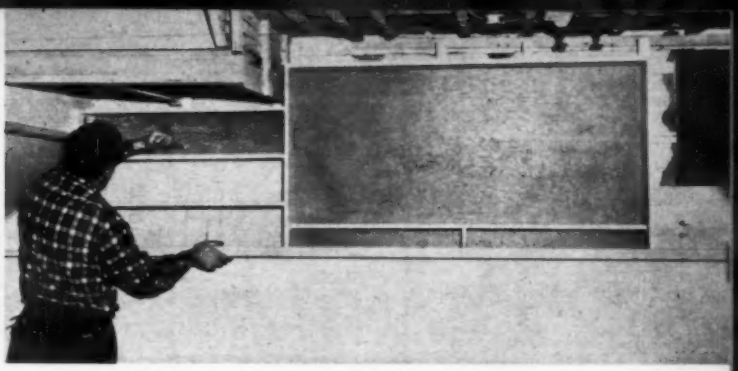
The sloped area beneath the stairs proved to be a natural for accommodating the L shape of the band saw. The

PLATE for a partition is secured with the aid of a Ramset fastener.



FURRING STRIPS are fastened to an outside wall to provide the base for a plaster board covering.

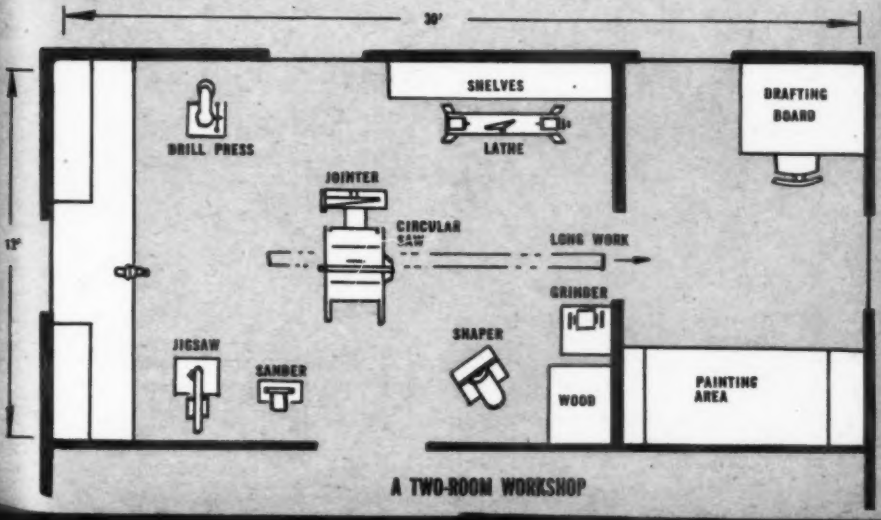
STAIRS are furred for a covering on the underside.



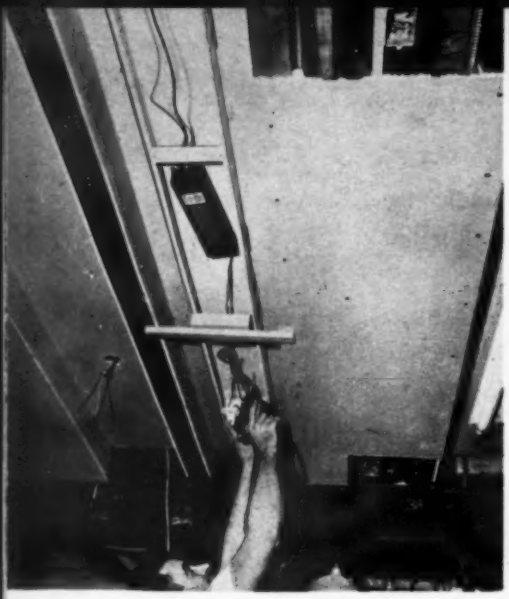
SHELF AND STORAGE UNIT is constructed separately from ¾-in. pine and ¼-in. plywood and then screwed to wall.

FACING BOARD at bottom of the wall unit is wired for three receptacles.

H-SHAPED CLEATS nailed between upper joists will support lamp fixtures and plaster board.



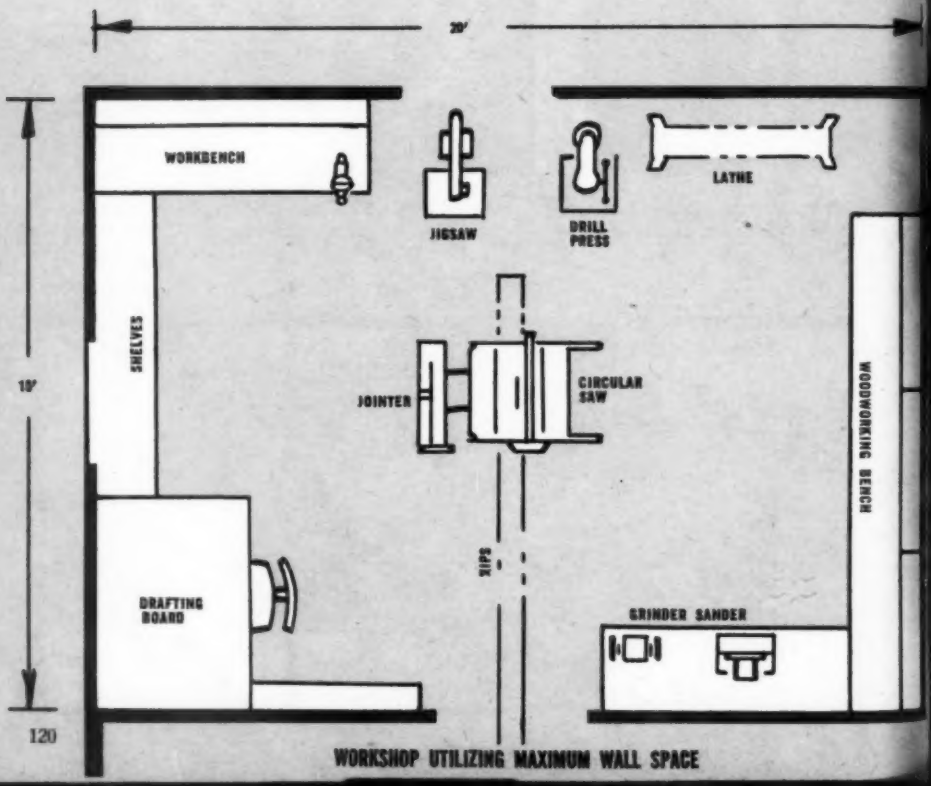
A TWO-ROOM WORKSHOP



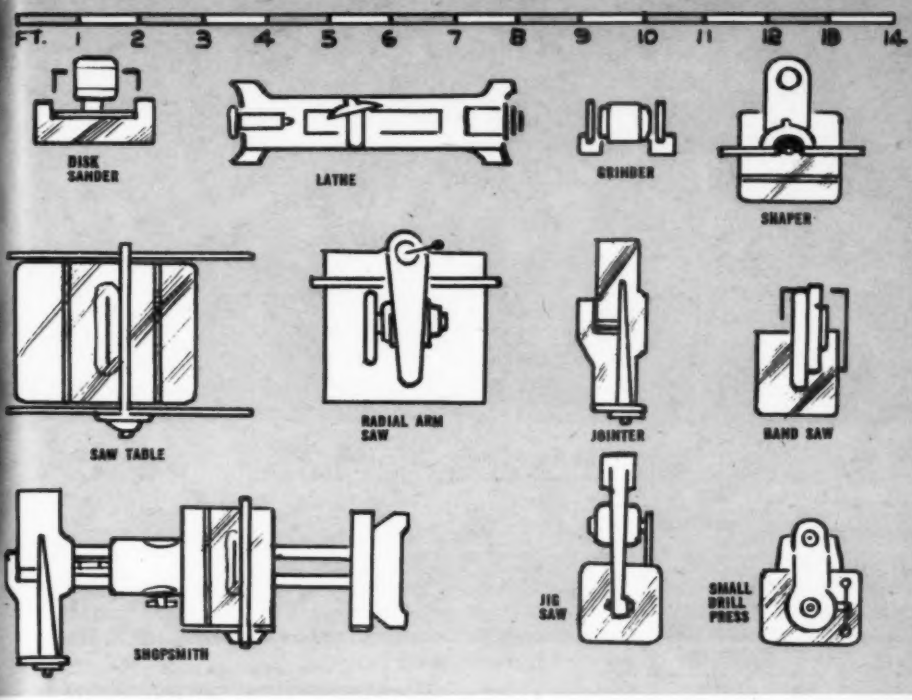
FIXTURES AND WIRING for fluorescent lights go into recesses between joists.

PEG-BOARD is trimmed to size with saber saw.

FOOTING is poured for relocated column.



WORKSHOP UTILIZING MAXIMUM WALL SPACE



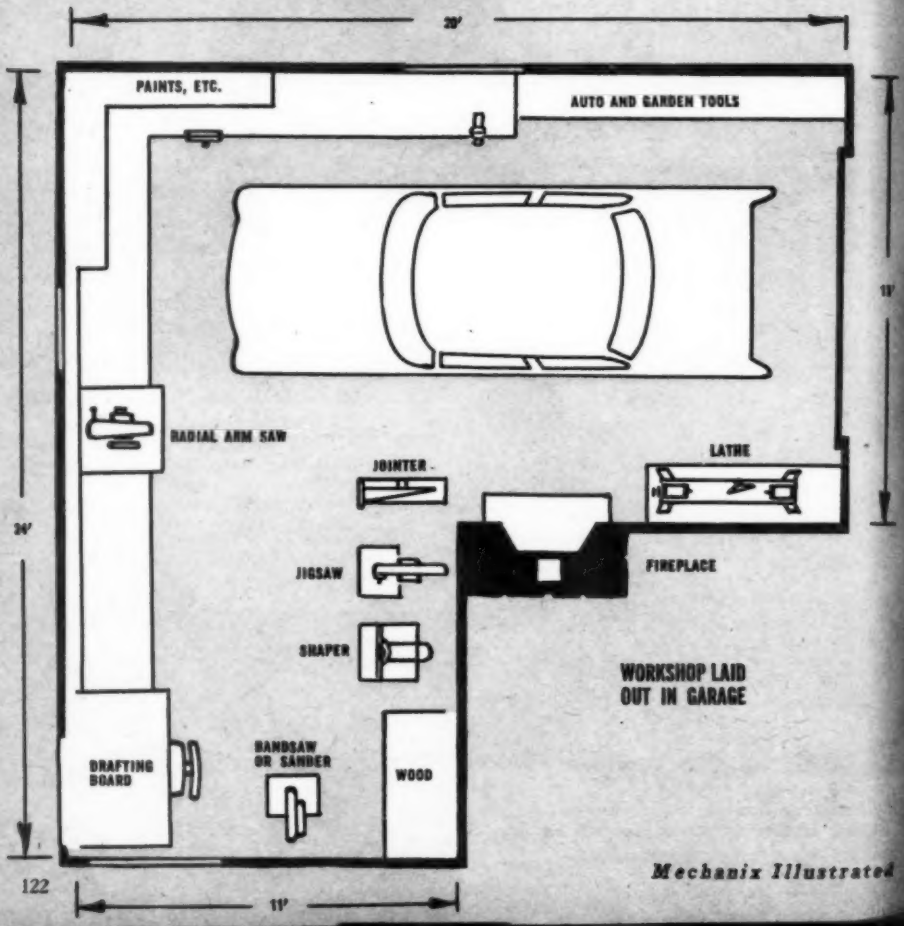
HIGH SPOTS have to be leveled and holes patched before the floor tile can be laid.

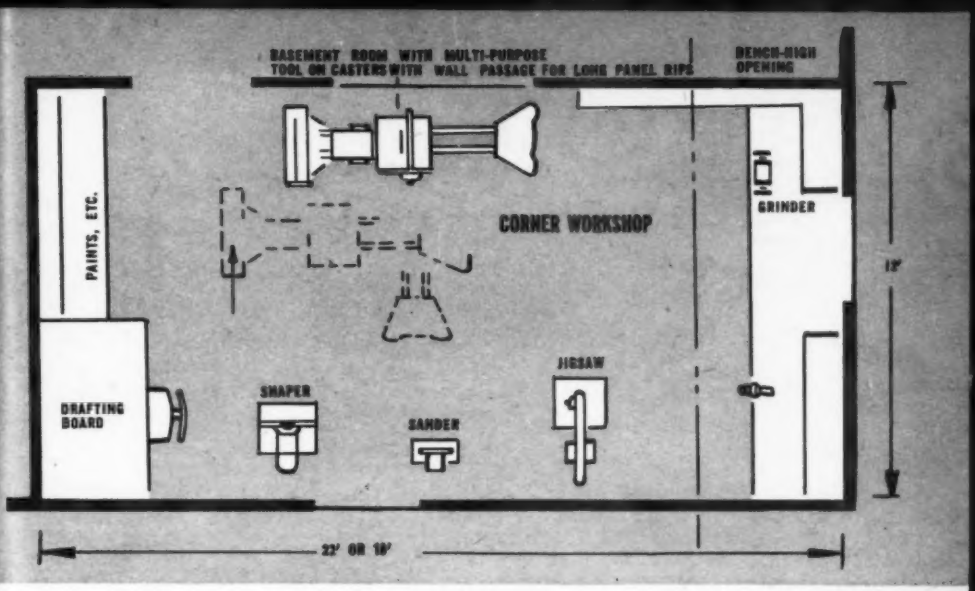
ROW OF TILES laid out across the center of the room determines the starting point.

STRING stretched tight across center of room is used for lining up the tiles.

PATTERNS are unlimited. The tile is laid in adhesive spread with saw-toothed tool.

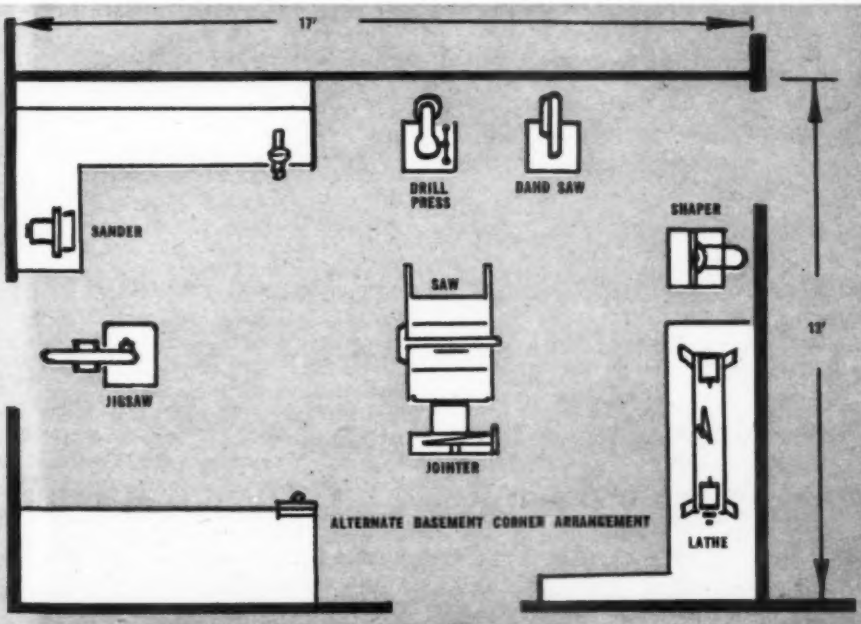
ROLLER PRESSURE on a cove molding completes installation of new workshop floor.





rest of the adjoining cement block wall, which had a horizontal setback, was furred. On top of the setback rests a wall rack and shelves with ample capacity. Above them are located the plumbing junctions for the house and these were closed in for appearance with one panel easily removable for access to the shut-off valves in case repair is required.

Near the end of the same wall was a waste line which stood out like a sore thumb, but it too was put to use. Boxed in, it became a side for another welcome shelf enclosure. To make stored items more accessible, each shelf was made progressively [*Continued on page* 174]



THIS LAYOUT FEATURES A LATHE

MI's ROLLING LUMBER RACK

Store loads of stock lumber and plywood panels on a pipe rack assembled with slip-on fittings.

ABOVE, basic materials and tools; below, Allen wrench is used to tighten fittings.

TWO prime considerations, simplicity and strength, led MI to design this lumber storage rack. Assembled with the new Hosking* slip-on fittings, it goes together in jig time.

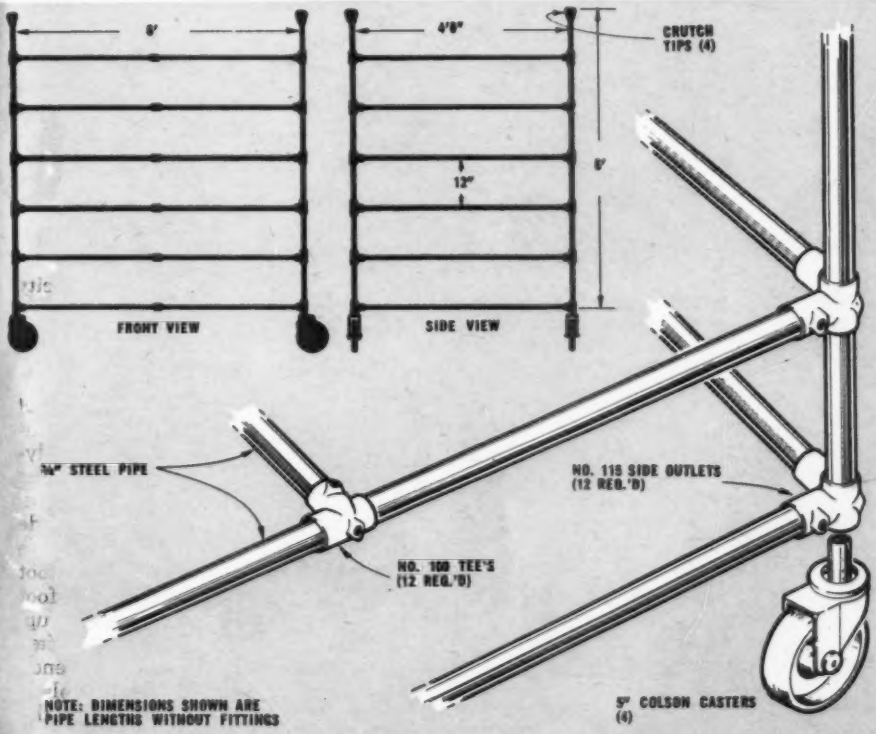
Six feet long and four and a half feet deep, with tiers spaced at one-foot intervals, the rack holds many 4x8 plywood panels and other lumber. A center cross bar permits stacking short pieces.

For construction, you'll need 24 side outlet elbow fittings and 12 tees. The ¾-inch steel pipe is cut into 16 six-foot lengths and 12 four-and-a-half-foot lengths. Work from the bottom up, spacing tiers with an 11-inch stick. After contact, two turns of a hex key wrench secures each screw. Five-inch, Colson double ball-bearing pipe casters in the corner posts complete the job. •

*J. H. Hosking Co., 1704 Howland Place, Cincinnati 23, Ohio.

PIPE CUTTER makes fast clean work of cutting the steel pipe to exact lengths.

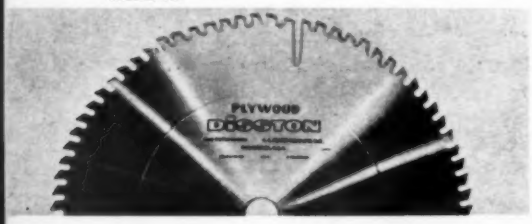
ELEVEN-INCH piece of wood is used between fittings to space the tiers evenly.



MI's HARDWARE STORE

SOLDERING IRON is ultra lightweight tool with built-in temperature control. Iron never overheats.

Weller Electric Corp., 691 Stone's Crossing Rd., Easton, Pa.



PLYWOOD-CUTTING circular saw blade has extra sharp teeth with alternate sheer bevels that do a clean, smooth cutting job.

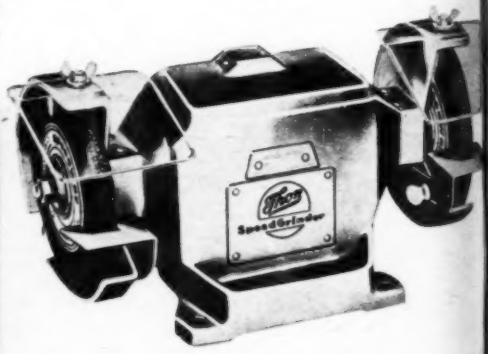
Disston Div., H. K. Porter Co., Inc., 501 Tacony, Phila., Pa.

RUBBERLOCK floor tile with interlocking edges requires no tile-to-floor adhesive: tiles are easily replaced should they be damaged.

Sears, Roebuck & Co., Chicago, Ill.

RECHARGEABLE flashlight battery plugs into any 117V AC outlet: can be recharged overnight and then reused hundreds of times.

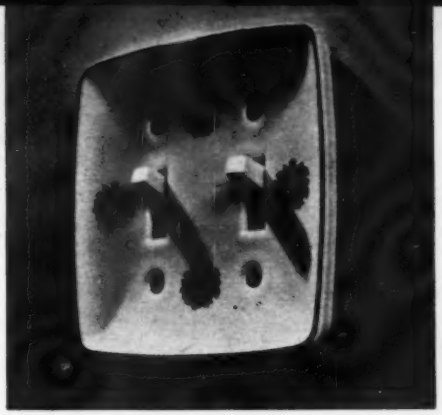
Sonotone Corp., Elmsford, N. Y.



SMALL, LOW-PRICED grinder handles most home sharpening jobs. Unit comes with one 40- and one 70-grit wheel. Price: $19.95.

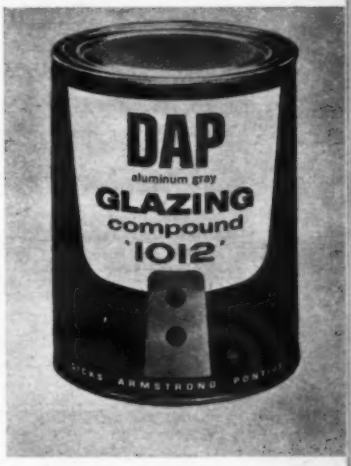
Speedway Div., Thor Power Tool Co., 1421 Barnsdale Rd., LaGrange Park, Ill.

JOHNSON'S 16-ounce push-button can of Upholstery Foam Cleaner will clean the entire interior of the average car. $1.25.
S. C. Johnson & Son, Inc., Racine, Wis.



CERAMIC SWITCHPLATES, door knobs and keyhole covers come in a variety of solid colors and designs, are extremely durable.
Yale & Towne Mfg. Co., Lock and Hardware Div., Stamford, Conn.

Name-Your-Poison booze decanters are authentic reagent bottles on which are etched "Sulphuric Acid" and "Nitric Acid." At $2.50 each they're available from Bottle-Nose Jones, P.O. Box 242, Greenwich, Conn. . . . Check the level of your hi-fi turntable with a Fedtro level from Ridgewood Sales Co., 68-51 Fresh Pond Rd., Ridgewood 27, L. I., N. Y. . . . A five-inch magnifying glass that fits over any standard fluorescent drawing board light is available from Glan Products, 8316 Seventh Ave., Bklyn. 9, N. Y. . . . A French face mask which prevents the wearer from inhaling dust can be had for $1.90 from H. J. Jensen, 350 Broadway, New York 13, N. Y.



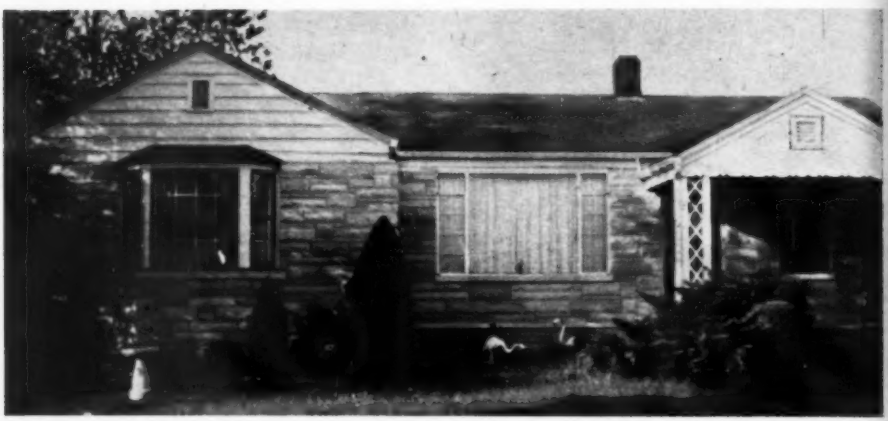
NEW SELF-WRINGING MOP with diamond-shaped head provides an extra cleaning surface.
Bissell, Inc., Grand Rapids, Mich.

DAP GLAZING COMPOUND is colored to match aluminum sashes. Easy to use, it needn't be painted.
Dicks-Armstrong-Pontius, Inc., Richmond, Calif.

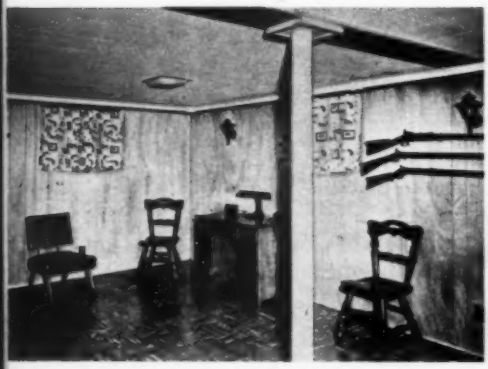
MAGNA-SANDER has built-in magnets that hold carbide sanding plate in place without screws; permits changing grits in a jiffy.
PAR Enterprises, Northbrook, Ill.

MARKER is all-aluminum felt-tipped instrument which will write on any surface, comes in eight colors and sells for 89c.
Cushman & Denison Mfg. Co., Carlstadt, N. J.

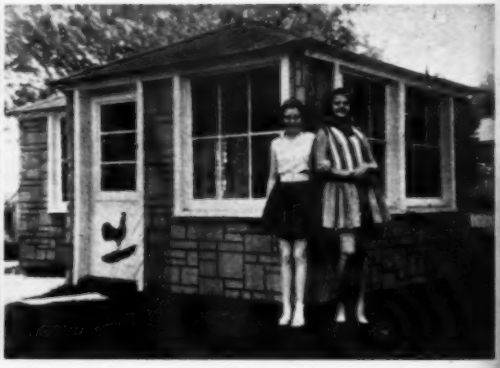
Golden Hammer Award Winners



EXPANDING AND IMPROVING his original four-room house has been the hobby of George Bennett, Jeffersonville, Ind., for the past 10 years. He faced his house with stone at a cost of $1200, added three rooms, a fireplace and breezeway and enlarged his garage.

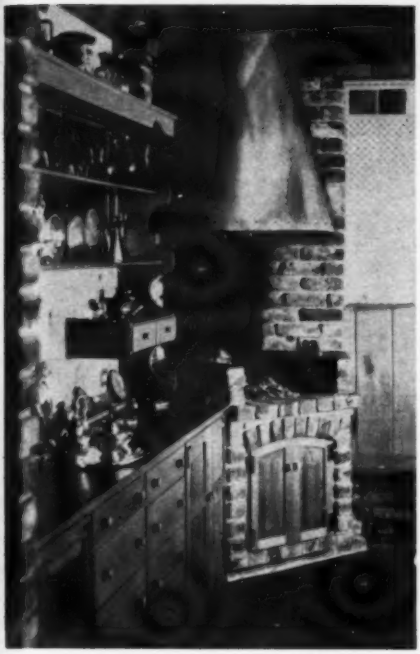


BASEMENT DEN was designed, tiled and paneled (with assists from Mrs. K.) by Henry Karzewski, Croton-on-Hudson, N.Y.



ROOMY L-SHAPED PLAY HOUSE was built for his daughter by Joseph Pavlina, York, Pa., in a few weekends using scrap lumber throughout.

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives*, and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.



COPPER-HOODED FIREPLACE and all-cedar sideboard are examples of the craftsmanship of M. R. Ehrer, Mill Valley, Calif.

MAHOGANY STEREO CABINETS were built by Leo Hycz of Oak Harbor, Wash., who also installed the component parts of the unit.

SPORTS CAR has Fiberglas body, Hudson frame, Olds '88 engine. It's the creation of Herbert Sturtevant, Daly City, Calif.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: William Schneider, Flushing, N. Y.; Walter J. Celli, Bronx, N. Y.; Martin Gorsky, Brooklyn, N. Y.; Edward Hulsman, Willoughby, Ohio; J. Suggers, Wendover, Eng.; Ralph E. Gibson, Plattsburg, N. Y.; Eileen Landay, New York, N. Y.; Albert M. Harding, Paterson, N. J.; Pete Torson, Akron, Ohio; Michael Perks, Jr., East Hartford, Conn.; R. Harrison, Manor Park, Eng.; L. G. Norris, Jr., Vincent AFB, [Continued on page 172]

21-FOOT CABIN CRUISER, designed and built by John Spies, Brockville, Ont., Can., sleeps four. Cost: $1300.

FROSTFISH

Flash over the ice in a boat you can build for $100. She's 16½ ft. with an 8-ft. span, carries 65 sq. ft. of sail and dismantles quickly for car-top carrying.

By Cal Smith

IF you've never experienced the sensation of flashing over the ice at 40 mph, you're really missing a thrill. Building Frostfish will put you into this exhilarating winter sport and you can do it for $100—less if you already own a sailing paddleboard, dinghy or canoe.

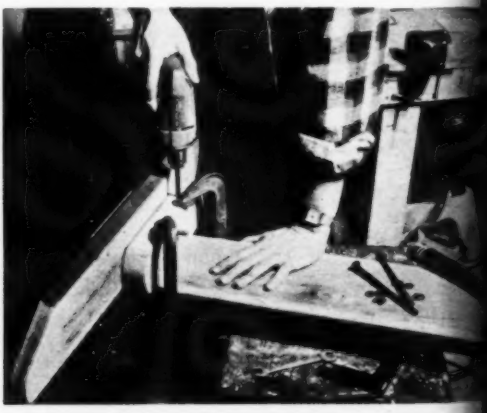
Frostfish was designed to be quickly and easily built. Ordinary lumber and construction grade steel are used throughout and hardware store fittings are specified rather than more expensive marine hardware. The sail and spars are adapted from the Alcort Sailfish but lateen or Gunter canoe rigs and dinghy spars and sails of 40 to 65 sq. ft. can be used.

Completely portable, Frostfish can be taken apart or assembled in a few minutes. The body weighs 65 lbs., the runner plank is 40 lbs. and the rig is 15 lbs. —any of which can be handled by one adult. The total 120-lb. weight is easily carried on top of a car or station wagon.

This is a fun craft, easy to sail and highly maneuverable. Carrying one adult or two youngsters, she'll do 35 to 40 mph in 20 to 25 mph winds. And she's safe. With the low lateen rig, she stays down on the ice where she belongs.

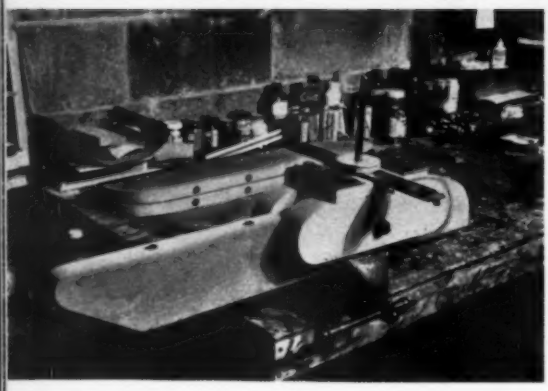
Construction is reduced to the barest essentials. The body is built of 2x4's joined in an acute isosceles triangle with plywood and 1x4 crosspieces. The runner plank is a 2x8 and the runners are built of steel angle, 2x4 fir or pine and 1x4 oak. Careful selection at the lumber yard will enable you to find good clear fir or pine. Although fancy woodworking isn't involved, a circular saw and a

BODY SIDES are 2x4's joined in a triangle with plywood and 1x4 crosspieces.

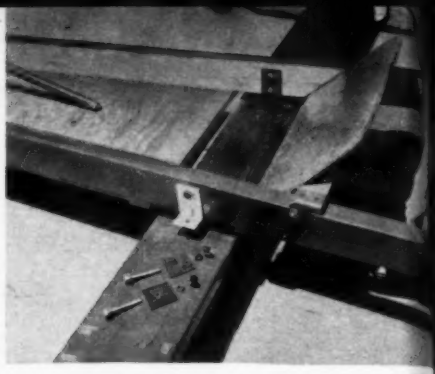


RUNNER CHOCKS are carefully aligned and clamped for boring holes in runner plank.

RUNNERS are made from ⅛x1-in. steel angle, then bolted completely through ⅜-in. oak. Large-scale plans show details of different types.



STEERING RUNNER. Steel straps serve as bearing plates for bolts used in assembly.



LOWERING the body of the ice boat onto the runner plank. Bolts go through angles.

STEPPING THE MAST. Each stay connects to eyebolt, one forward and two on runner plank.

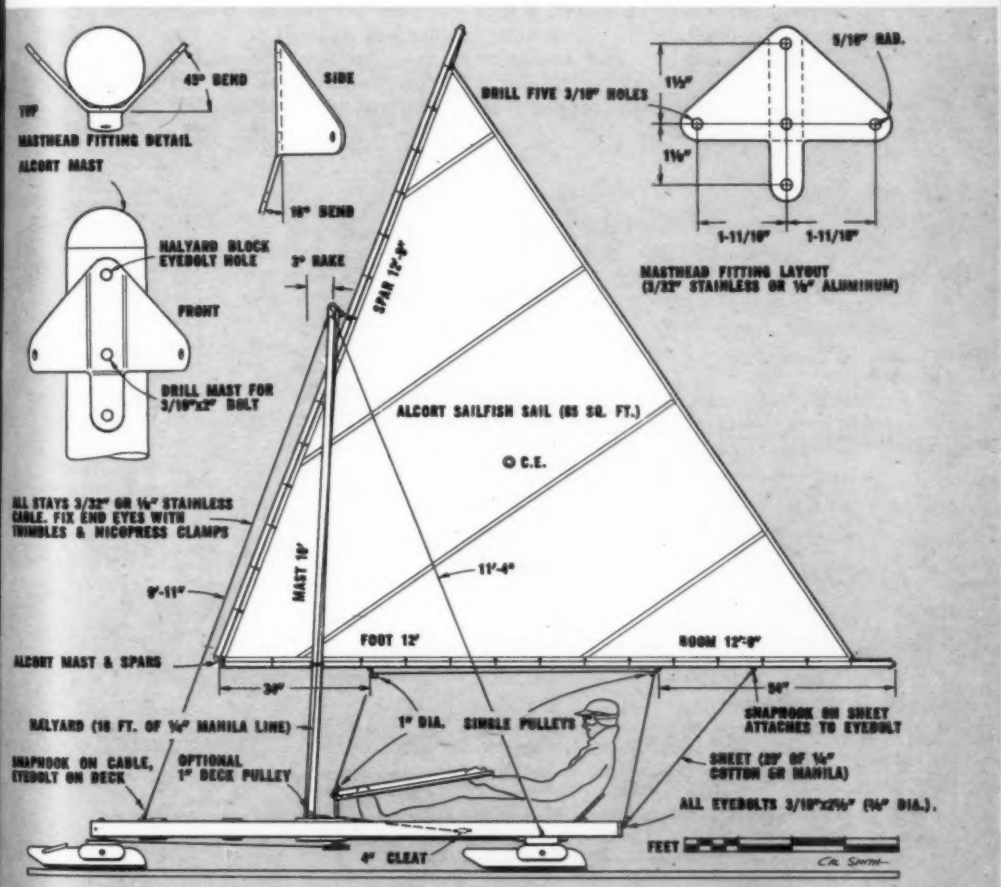
jig or band saw will speed up building. A drill press should be used for drilling the metal parts.

Begin with the body. The sides are at a 5° angle with the centerline, so power tools can be preset at this angle. After beveling the ends, lay the sides on sawhorses and nail a piece of scrap 1x2 across the front end to join them temporarily. Then glue and screw the 1x4 crosspiece in place at the rear end. Next cut out the half-inch plywood crosspieces for the front section and screw the bottom ones in place. The bottom piece of the ¾-inch plywood mast step is then bored with a ¾-inch dia. hole

for the steering post and fastened in place. The half-inch plywood floor is put on later since it must be fitted to meet the runner plank cleat.

Now turn the body over and install the plywood and 1x4 crosspieces. Before screwing down the front piece, put an eyebolt in place for the forestay. Then cut the lower mast step of ¾-inch plywood to fit the foot of the mast. This piece should fit snug inside the 2x4's behind the 1x4 crosspiece and should be glued and screwed to the bottom ¾-inch plywood panel. The 2¼-inch mast step hole should be located a quarter-inch forward of the hole in the top panel to give a 3° rake to the mast. Bore the top mast step panel for the mast and steering post and screw it in place, shifting it to align the mast and post accurately.

With the crosspieces in place, the body is turned bottom up to mark the position of the runner plank. Carefully align the plank so that it will be at right angles to the centerline. The best way to do this is to measure the diagonal from the ends of the runner plank to the front of the body. The diagonal dimensions must be equal. When the plank alignment is set, attach 1x2 cleats across the bottom of the body fore and aft of the runner plank, fitting them snugly



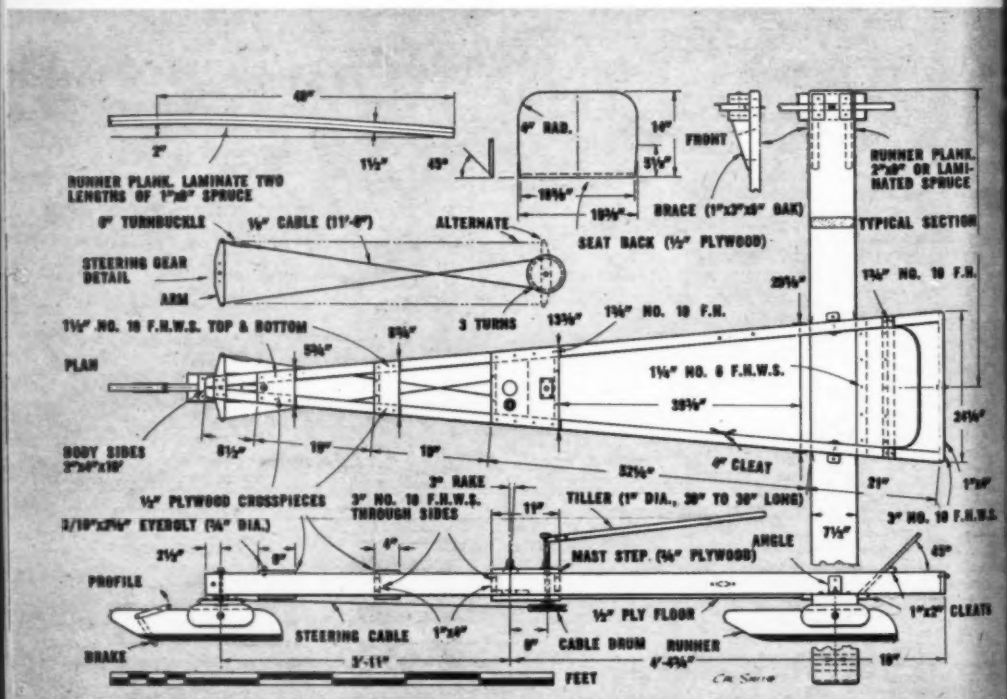
against the runner plank edges. The half-inch plywood floor can now be screwed and glued to the bottoms of the 2x4's.

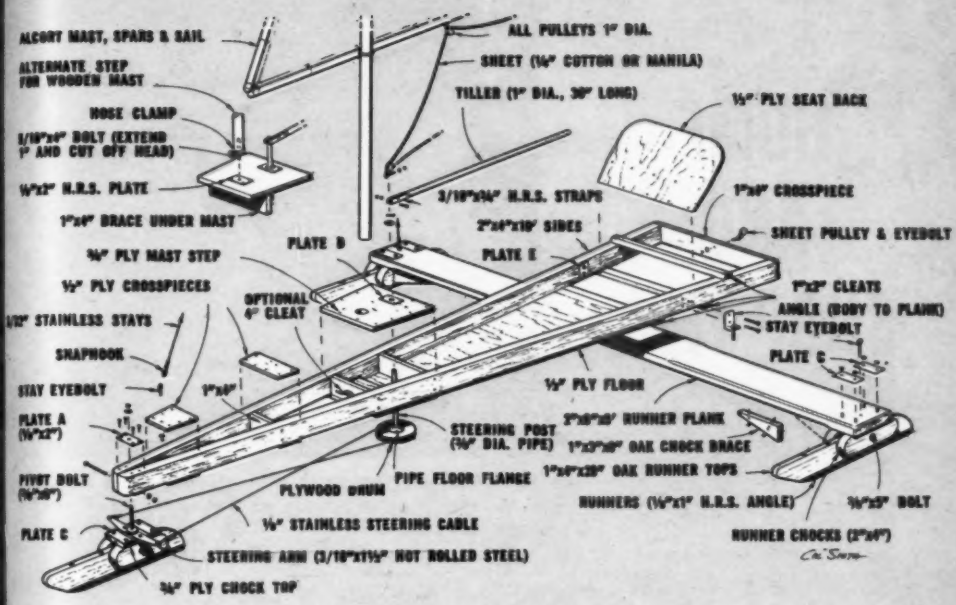
Turn the body over again to add the seat back. Bevel the edge of a 1x2 at 45° to form the seat back cleat. Screw it in place and then attach the other cleats below. This completes the woodwork on the body. Go over the whole structure with sandpaper, rounding off all edges.

The runner plank can be tackled next. If you wish to go to the extra trouble, you can make up a laminated, arched runner plank that will make the boat ride easier on rough ice. Use two layers of 1x8-in. boat grade spruce, glued while clamped in the arched position. Set up two sawhorses under each end of the plank with a scrap length of 2x4 between the ceiling and the plank center to bow down the center a half inch more than desired. Use waterproof glue and clamp the lamination at the center. Also clamp both sides every eight inches. You will need at least two dozen clamps.

The simple runner plank used on the original Frostfish is an eight-foot length of 2x8 pine. We sorted through a considerable stack of lumber to find a knot-free piece. We also selected one that was warped close to the desired arch. The plank should be carefully marked at the center and ends trimmed square. The edges are planed and sanded one quarter round except along the top edges touching the cleats under the body and on the bottom edges at the ends where the runner chocks are attached.

The runner chocks are made next. The steering runner chocks are one half-inch shorter than the others. Clamp each pair together and drill for the runner pivot bolt on a drill press. Holes for $\frac{5}{16}$-in. attachment bolts should also be drilled on drill press. It is most important that the runner chocks be bolted to the runner plank at right angles so that the runners are exactly parallel. Any





toe-in or out of the main runners will only create unnecessary drag. A trick to help maintain chock alignment is to cut a ⅛-inch groove the width of chock into the bottom of the runner plank so that chock is set into the runner plank. Bolt the chocks in place on the plank, putting ⅛x2-inch strap bearing plates (C) on top of the plank to prevent crushing the wood when the bolts are tightened down.

The steering chock should be made next. Cut a groove for plate B in the chock tops. This plate serves as a bearing surface for the upright pivot (king) bolt. The large-scale plans contain detailed drawing of fittings such as plates B and C. Most of these fittings are cut from ⅛x2-inch hot rolled steel strap. This is ordinary building construction material and should be readily available. Other metal required is also hot rolled steel of common sizes. Some hardware stores or builder's supply houses carry Redi-Rods in required sizes. One important point to remember is to give the underside of metal fittings a thick coat of paint to prevent rusting before attaching them permanently in place.

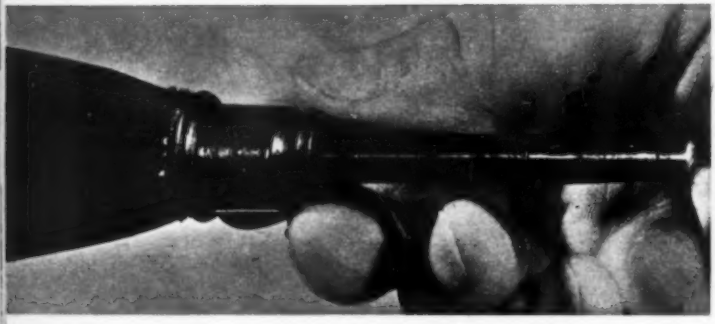
The runners come next. These are very important parts of any ice boat so extra care is required. Cut the oak tops to shape and sand them smooth. Then drill for the pivot bolt on a drill press. The runners used on Frostfish consist of ⅛x1-inch hot rolled steel angle bolted flat to the bottom of the oak top. The lower edge of the angle is ground to a 45° V. This edge is also ground with a crown of about [*Continued on page* 166]

LARGE-SCALE PLANS

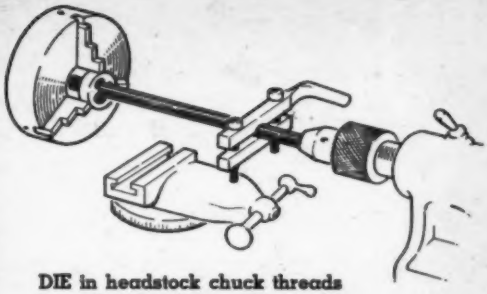
include complete details of all structural members and fittings, a bill of materials and suggestions for adapting other sail rigs. To order a set, send $5.00 to MI Plans Service, Fawcett Bldg., Fawcett Place, Greenwich, Conn. Specify Plan B-239, Frostfish.

HOME AND SHOP TIPS

KING-SIZED LAZY SUSAN holds scores of bottles containing shop hardware and sundries. Each shelf turns independently of the others on the steel pipe.

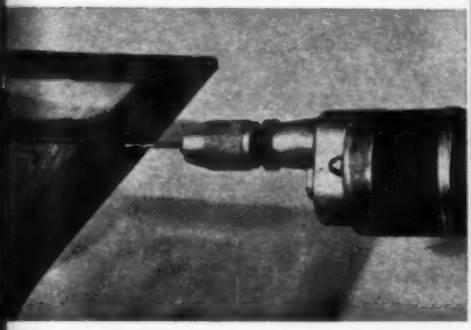


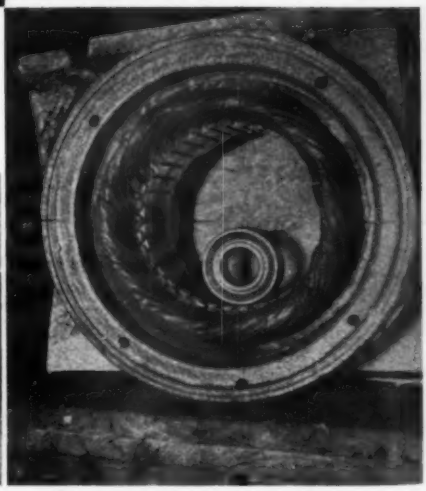
RUBBER NIPPLE from distributor slips over tip and around end hinges of umbrella, prevents fabric from wearing at that point.



DIE in headstock chuck threads long shaft as shown. Compound will act as stop for lathe dog.

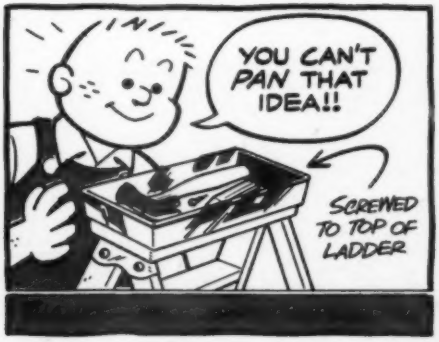
WINDSHIELD SCRAPER is easy to make from clear Plexiglas: round the corners, square edges, drill end hole, slip on chain.



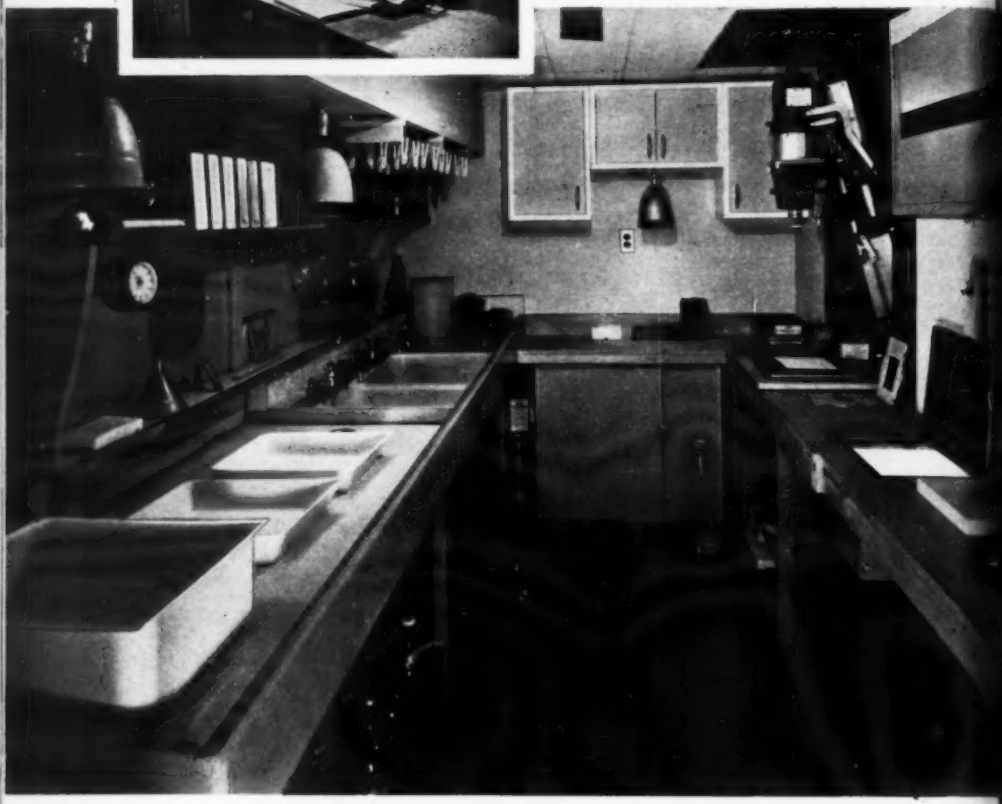


METAL-CHANNEL screen frames may accumulate water and rust. Prevent this by drilling small drain holes in bottom channels.

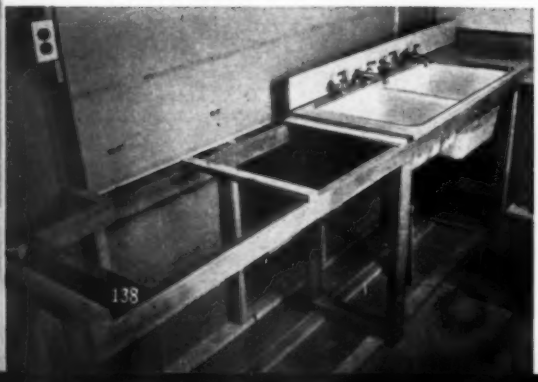
IF ALL'S WELL, a roller bearing will prove a motor rewind job by racing around the stator when the current is turned on.



THIS PHOTOGRAPH shows the unsightly basement corner that existed before this area was transformed into the up-to-date and fully-equipped darkroom shown below.



A PRACTICAL DARKROOM



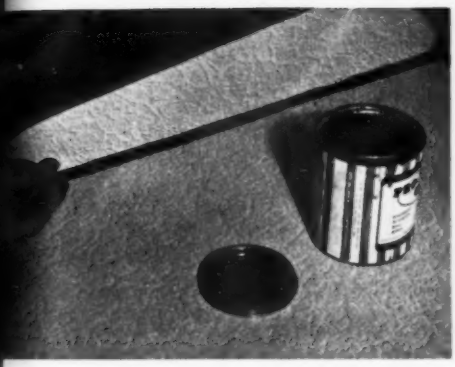
WET-TABLE frame is of 2x4's. Install a combination cabinet sink for best results.

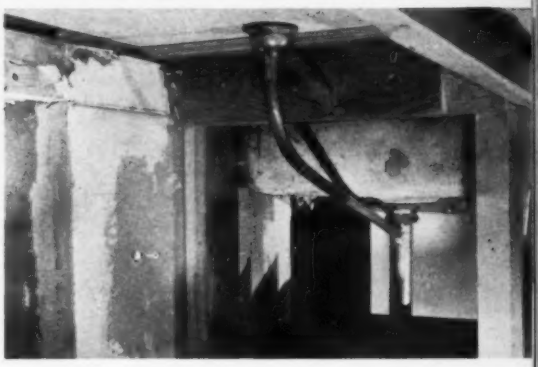
By John Michaels

IF YOU have a bit of spare room in your basement and some spare grease in your elbows, roll up your sleeves and get busy—a neat functional darkroom is waiting to be built.

No specific dimensions have been given because your individual space al-

PICTURE SEQUENCES BELOW show installation of two-tier shelf along the full length of the sink; application of Formica along the backsplash; application of neoprene to all joints and seams of the wet table; and installation details of the copper tubing which is soldered to the drain of the wet table.





The most elementary knowledge of carpentry is all that's required to build this dream of a darkroom.

locations will vary, but you can take advantage of the methods of construction and the design used by applying your dimensions to suit.

To pack the most darkroom in a relatively small area (6x13 feet) a U design was employed. The sizeable Formica-lined, waterproof wet table accommodates three 16x20-inch solution trays. Provision for flooding for temperature control is also included plus full use of a combination sink with ample storage space below.

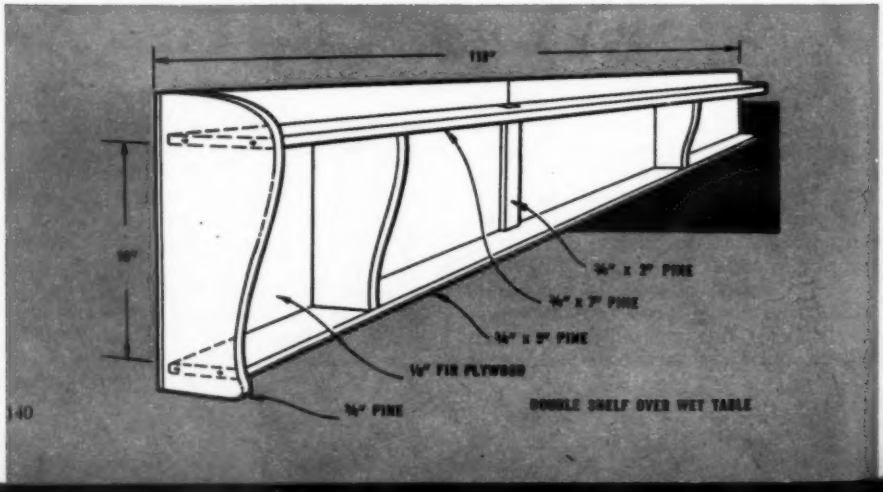
The dry table, which extends the full length of the room, adjoins the sink drain board. With the enlarger near the far end of the room and a built-in combination contact printer-viewing box alongside, the remainder of the table leaves plenty of space for print finishing. Inexpensive metal kitchen cabinets proved ideal for paper and film storage.

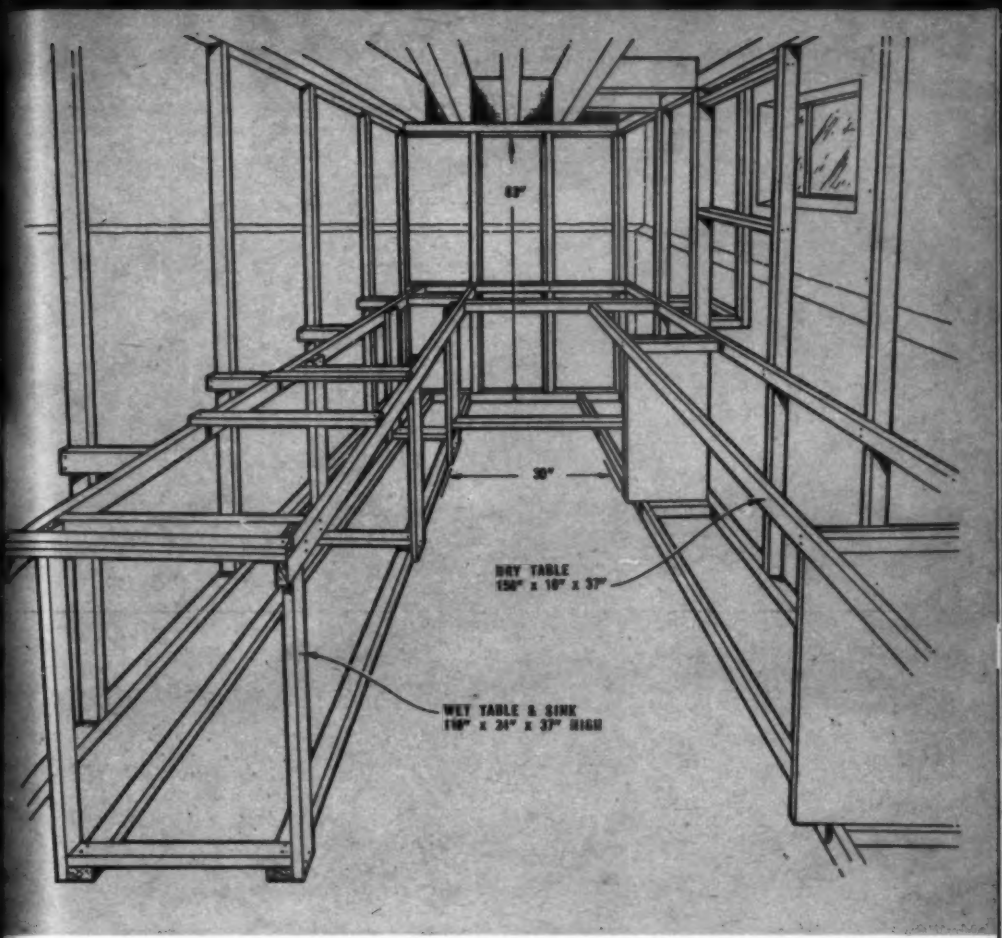
ENLARGER area is finished with plasterboard. Note placement of outlet, switch.

CEILING above enlarger is recessed to allow full use of this piece of equipment.

HINGED pressure plate of plywood and sponge rubber is secured by spring catch.

OUTSIDE LOUVER fits over the cellar window and protects exhaust fan from rain.





The enlarger location was recessed to allow the enlarger to be accommodated efficiently in the least possible space. For fresh air, a simple but effective lightproof air vent with exhaust fan can be installed at the window.

To begin, choose your location with care. Keep in mind two important considerations: plumbing facilities and ventilation. Of course, if necessary, fresh air can be piped in through a duct, but this means extra expense and labor.

A partition wall for enclosing the room was quickly and inexpensively constructed with 2x4 studs and plasterboard. The entire room was lined with plasterboard to achieve a neat, clean atmosphere. Ample electric outlets were provided and installed before closing in the walls with plasterboard as shown.

With the room enclosed, the next order of business was construction of the wet table. A framework of ten-foot 2x4's was constructed along the left wall. A piece of ⅝-inch plywood board was screwed into place to form the table top. A slight slope toward the sink was employed to provide drainage. Wood screws were used exclusively in assembling this table to insure rigidity and tight joints.

Next came the installation of a double-shelved back-splash running the full length of the wall. Built as a separate unit this functional back-splash was easily placed into position.

Formica was used for a durable, attractive and [*Continued on page* 176]

MONTHLY PHOTO CONTEST

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Address entries to: *Mechanix Illustrated*, Photo Contest, 67 W. 44th St., N.Y.C. 36.

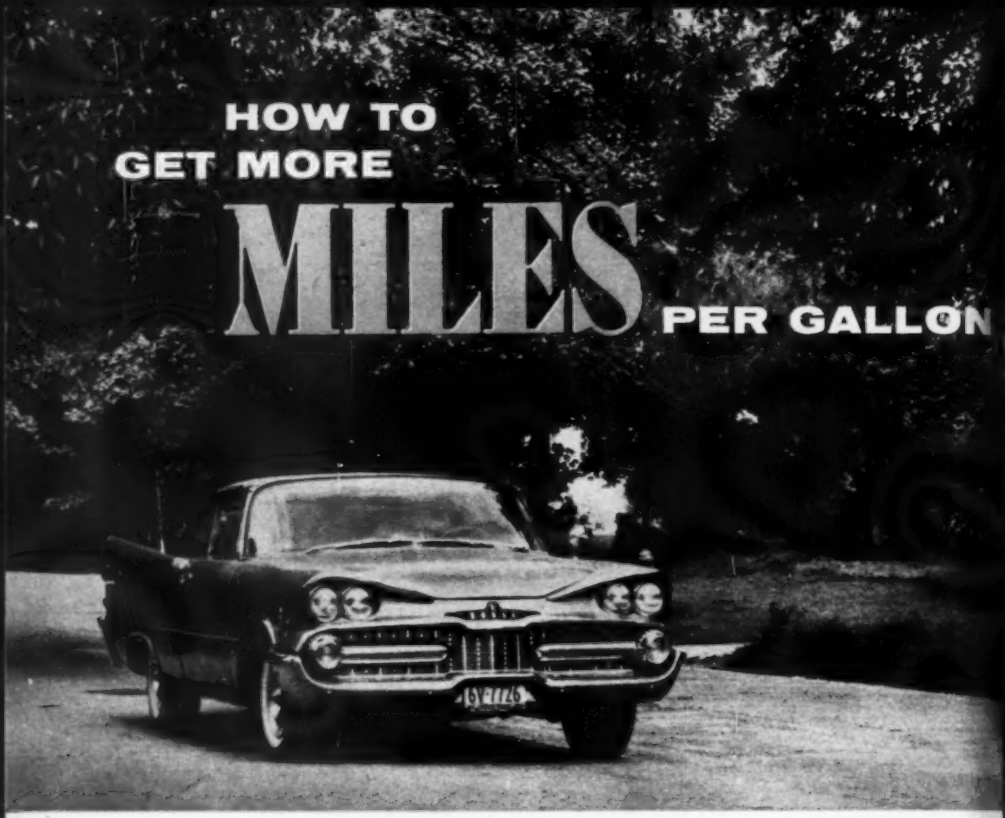
First Prize ($25) .....Lake Hakone
Horace Wong of the 25th Ammunition Supply Squadron in Utah took this shot with a Rollei camera. Verichrome Pan, 1/125th at f-22.

$10 Award .....Hungry Hannah
The little girl is photographer Bob Bennett's daughter. A 4x5 Speed Graphic flash shot, f-32, 1/100th sec.

$10 Award ....Hatches, Matches, Dispatches
By Elbert Shea of Houston, Tex. Taken with a Yashica camera; 1/5th second at f-8, Tri-X film. Original enlarged on Medalist paper.

$10 Award ......"Play Ball!"
This gorilla was snapped in the Chicago zoo by R. W. Richardson; Mimiyaflex camera, strobe lighting, Ansco Super Hypan.

HOW TO GET MORE MILES PER GALLON



By Frederick C. Russell
Member, Society of Automotive Engineers

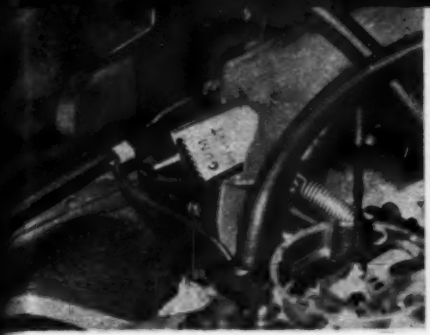
CAR CARE

GETTING more miles to the gallon from today's cars may seem like wishful thinking but it can and is being done. Whether or not you are currently matching the national gas average of 12.47 mpg, the experts who win economy runs say you can get much more than this—even as much as 10 miles more per gallon!

By observing such matters as "shift points" with automatic transmissions, ignition timing and more skillful handling of the throttle you'd be surprised at the fuel savings that can be chalked up. You must also consider the fact that much economy starts with the car itself—its design, power reserve and its power transmission system.

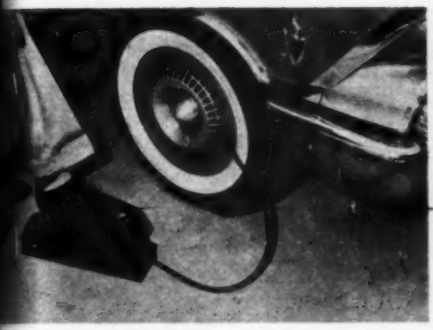
A note of caution: be on your guard against some of the impractical ideas too freely advanced on this subject of fuel savings. On paper, for instance, a car with a lower-than-normal rear axle ratio should give increased economy. But in practice the driver would find it necessary to shift into a lower gear on every upgrade and after turning every corner.

Slightly less than a 3:1 ratio is about right for powerful cars. This can be somewhat higher for cars with less zoom and for powerful cars pulling heavier-than-usual frames and bodies. The Dodge Coronet which won over all standard-size V8's in the 1959 Mobilgas Economy Run carried a rear axle which allowed the engine to turn only 2.93 times for each revolution of the rear wheels, but for the Coronet Six (with or without automatic drive) factory speci-

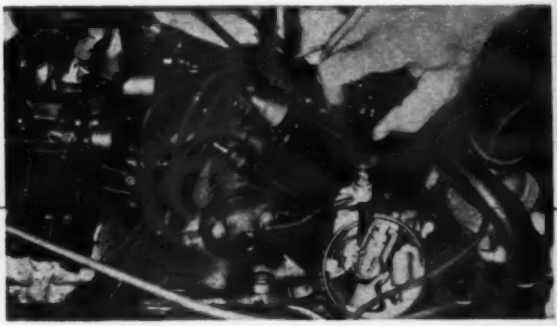


APPLY GUM SOLVENT to throttle control linkage to assure mechanism's free action.

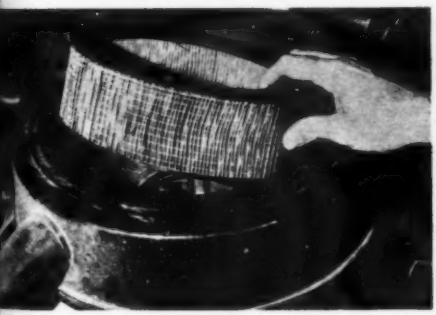
FAULTY motor thermostat can waste fuel, so check this unit's operation regularly.



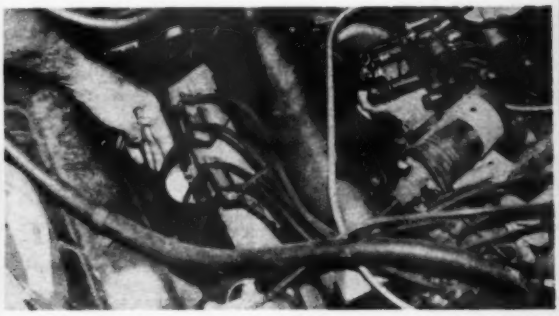
UNDERINFLATED TIRES rob your engine of power and hence increase your gas bill.



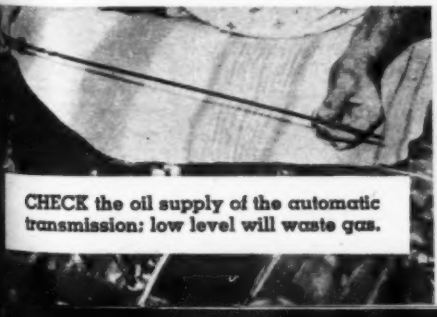
BREAKER POINTS that are clean and properly gapped will cut down gas consumption.



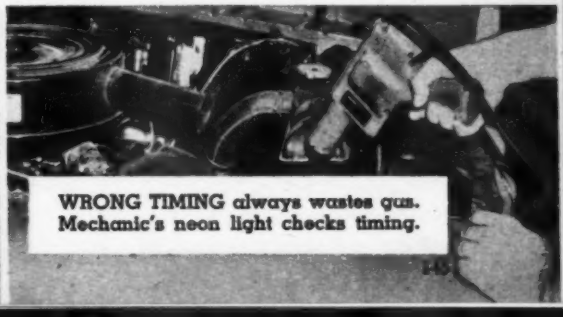
REPLACE a clogged air cleaner element which wastes gas by enriching the mixture.



CHECK for a stuck manifold heat-control valve as a possible source of fuel loss.



CHECK the oil supply of the automatic transmission; low level will waste gas.



WRONG TIMING always wastes gas. Mechanic's neon light checks timing.

fications call for a ratio of 3.73. Other ratios are: 3.31 for V8 models with Torqueflite transmission or 3.54 with the three-speed conventional shift; 3.54 for the Studebaker Lark Six; 3.31 for the V8 with automatic drive; and 3.75 for the Plymouth Six.

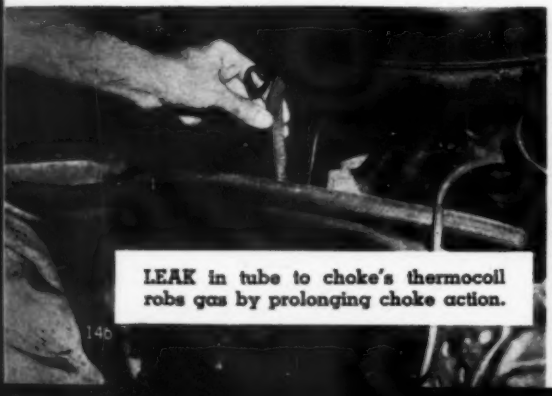
The ratio of the Continental, on the other hand, is 2.89. So it is plain that the lower powered cars require a higher rear axle ratio. The same principle applies to tires. Pump them six pounds higher than factory recommendations and your gas mileage will increase—but so will punishing jolts to the suspension system. It is also easy to boost gas mileage by leaning out the gas mixture but this spoils cold-engine operation and makes for a much hotter mixture that can burn out the valves. Moral: Don't go for *any* gimmick just because it promises to boost your gas mileage.

Now let's assume you are careful to keep breaker points and spark plugs in top form, that you speed up when approaching hills rather than hitting a grade moderately and then accelerating, that you make a practice of "reading" traffic signals in advance to keep braking and shifting to a minimum, and that you avoid jack-rabbit starts and high speeds. So far so good—but there are still other steps you can take to further reduce gas consumption.

"Shift points" are important in saving gas. With a little experimenting you will find that by lowering the car's speed for the shift to second and then to high you will add many "free" miles. Some experts in the economy field go all out for adjusting shift points downward. However, automatic transmissions re-

SAVE GAS by "reading" traffic signals in advance, thus reducing stops and starts.

ALL SPARK PLUGS should be cleaned and accurately regapped at regular intervals.



LEAK in tube to choke's thermocoil robs gas by prolonging choke action.

LONGER carburetor-to-transmission link lowers shift points, saves gas.

spond to your own handling of the accelerator to a point where you can lower the shift points to meet your own requirements.

Enforced shifting of automatic gears is obtained through special linkage to the throttle. By shortening the carburetor-to-transmission linkage you increase throttle pressure, making upshifts higher. Reversing this lowers the "shift points." By the way, this work should be done by someone who fully understands the job.

If the throttle linkage control is properly adjusted to factory specifications, and linkage and accelerator are not binding, fuel savings are best effected by more skill in handling the accelerator pedal. By taking it easy, for instance, a Hydra-Matic transmission that is adjusted to upshift from first to second at 13 to 17 mph with full throttle will make the shift in the five-to-seven-mph range. And you can cut the second-to-third shift from the 36- to 40-mph range to the 10- to 12-mph range while the third-to-fourth shift can be dropped from the range of 69 to 73 mph to that of 16 to 19 mph.

While a speed of 55 mph seems modest enough, many cars at this clip will suffer an 18 per cent drop from peak economy. It is important, therefore, to experiment with your own car to know at what speeds you're getting peak fuel efficiency. All the experts emphasize the importance of driving leisurely until the engine warms up.

As for hills, don't take them at less than 35 mph. On downgrades economy vies with safety. Here wise drivers forget fuel economy; they start downgrades moderately, downshifting if necessary to save brakes.

Gas savings can be effected by advancing the ignition timing as much as 14 degrees BTC but this can only be done satisfactorily if the car is operated at moderate speeds and its cylinders are free of carbon.

By following the tips mentioned in this article you will do more than save money by getting additional miles from a gallon of gas; you will also extend the life of your car by instituting driving practices that cut down on the wear and tear your engine was receiving. •

SERVICE TIPS

from Detroit

Part No. 3201772, Gear Selector Control Park Brake Slide, is now available to Rambler owners. This part eliminates the necessity of complete gear selector control assembly replacement where only the slide has been broken on the early '59 Series cars.

Blower motor noise can be reduced on those '59 Fords equipped with the SelectAire Conditioner by installing a sound deadening plate in front of the air intake screen or by providing a special motor mounting plate and insulated cradle to support the blower motor.

Dodge warns owners against drilling additional holes in master cylinder covers on the assumption that the existing vent is plugged up and causing "loss of brake pedal." Drilling such holes may allow dirt to enter the hydraulic system and result in damage to the brake system. Only a properly vented cover should be used.

A four-amp fuse was added to the Cadillac Cruise Control circuit at about Engine No. 0077640. It's located in a separate holder in the jumper wire feed circuit between the plunger-type stoplight switch and the Cruise Control terminal in the louver-type stoplight switch.

Ignition timing on all 1959 Chevrolet passenger car and truck six-cylinder 235 cu. in. engines is now being set at 5° Before Top Dead Center. This change from T.D.C. was made to improve engine performance and economy. For the early '59 production engines, Chevrolet suggests you reset timing to the new specifications. Ignition timing on all past models 235 cu. in. and all 261 cu. in. engines will remain at T.D.C.

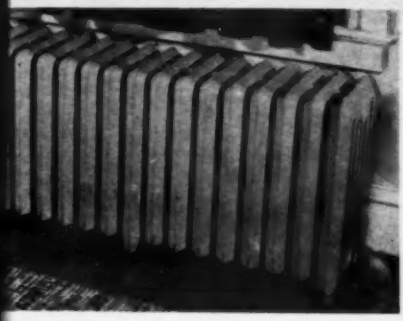
VENETIAN BLIND SLATS dress up this radiator cover, deflect heat toward the floor.

De Luxe RADIATOR COVER

IF you live in an older house, chances are that you have unsightly radiators in every room. Well, it's easy to dress them up with attractive louvered covers which do not interfere with heating efficiency. In fact, the slats deflect the heat downward so that it warms the floor before rising.

Metal slats are available in a wide variety of colors from blind manufacturers and are easily cut to proper length with a pair of tinsnips. If the radiator is a long one, a center support will be needed as the drawing shows; otherwise it can be left out.

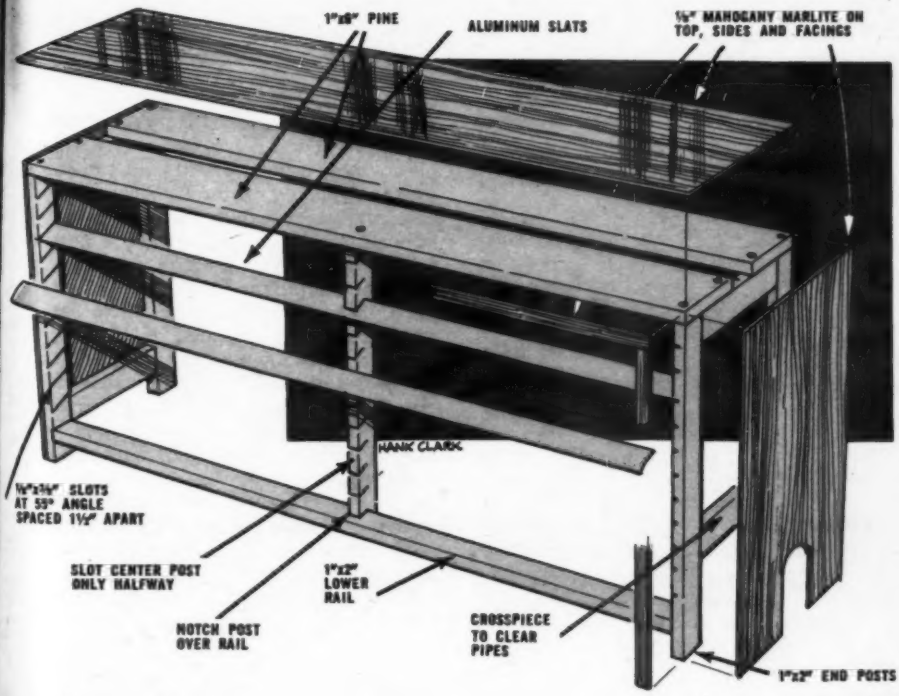
Construct the framework according to the drawing, with dimensions to suit the radiator, and assemble it with glue and screws. Mahogany-grained Marlite covers the top, sides and front edges and is bonded to the wood with Marlite cement, applied [*Continued on page* 199]

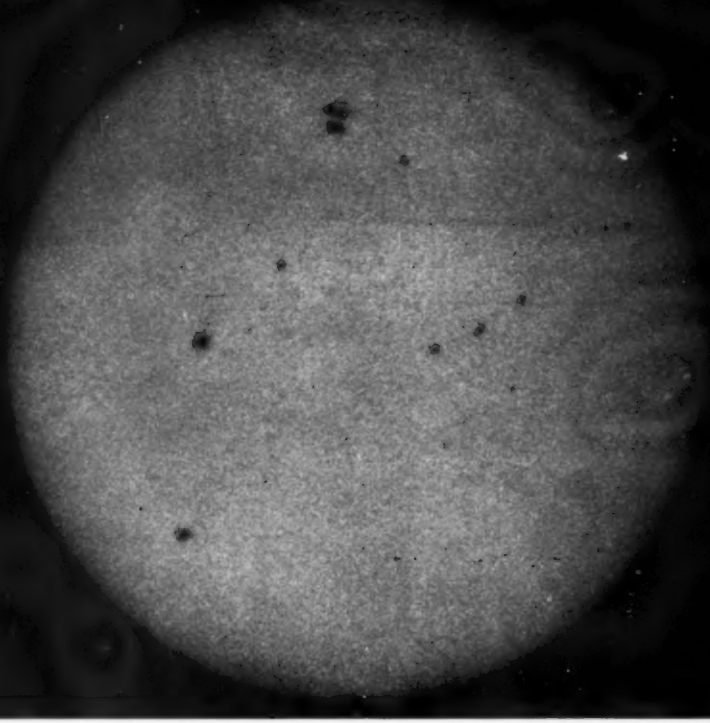


EXPOSED radiator is not only unsightly but a great dust collector.

METAL SLATS fit into slots in uprights. The exposed wood is stained.

MARLITE side pieces are cut to correct size and applied to frame with adhesive.





THE AMATEUR TELESCOPE MAKER'S PAGE

SUN SPOT PHOTOS

The sun photograph at the top of this page was made with a 75-cent lens and a cardboard tube attached to an Exakta.

ROBERT W. FERREL, Jr., of Memphis, Tenn., uses a 75-cent "telephoto" lens to take pictures of sun spots and the moon's craters! First he purchased, from a mail order house dealing in war surplus optical goods, a double convex lens with a 48-inch focal length. Next he obtained a cardboard mailing tube about 50 inches long. The inside of the tube was "washed" with a black paint to cut down internal reflections. Some felt glued to the inside surface of the lower end of the tube allows the tube to be slipped over the camera lens mount for a good, snug fit without any light leaks.

The lens is fitted to the top of the tube with a couple of cardboard washers and some glue. The lens was stopped down in order to get sharper definition by cutting a ¾-inch hole in a black cardboard disk [*Continued on page* 200]

new 75hp STARFLITE II with Jetstream drive

TODAYS TOP-PERFORMANCE OUTBOARD MOTOR

JETSTREAM DRIVE breaks the "*drag barrier!*" Just as jet planes changed shape as increased power boomed them to supersonic speeds . . . so has the Starflite II lower unit evolved into a new shape to translate its 50% greater power into higher speeds.

More than speed alone! Starflite II delivers a new kind of performance . . . high thrust at all speed ranges, under all loads. Its smooth, balanced V-4 engine pours out 75 horsepower. *Jetstream Drive* delivers its high thrust with high speed efficiency . . . *without sacrificing control.* Its fin-slim gearcase houses full gearshift transmission. Here, for the first time, is a true high-speed lower unit with the safety and pleasure of complete automotive-type gearshift control.

Starflite II with *Jetstream Drive* is today's top-performer for skiing, cruising and big family-size runabouts. Best of all, you can own it at the lowest cost per hp in history! See it at your Evinrude dealer now!

A Division of Outboard Marine Corporation
In Canada: Mfd. by Evinrude Motors, Peterborough

Ask your Evinrude dealer about 16 mm color movies

EVINRUDE FIRST IN OUTBOARDS

CATALOG FREE!

EVINRUDE MOTORS
4240 N. 27th St., Milwaukee 16, Wis.

Send me catalog of 1960 Evinrude Motors with details of today's most advanced features.

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You do the choosing! The Army's new "Choose-it-Yourself" System lets you pick valuable training before you enlist. Here's how it works:

1. Choose before enlistment. Choose your training from fields like Aircraft Maintenance, Radar and TV Repair, Drafting, Atomics, Printing—and many more.

2. Qualify before enlistment. Take aptitude and physical exams to qualify for the training you've chosen.

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Choose, qualify, know—this week! Ask your Army recruiter to show you his complete list of available training fields.

Want training in Aircraft Maintenance? Communications? Engineering?

choose-it-yourself before enlistment!

Helicopter Mechanic and Instructor

CHOOSE IT YOURSELF VOCATIONAL TRAINING SYSTEM

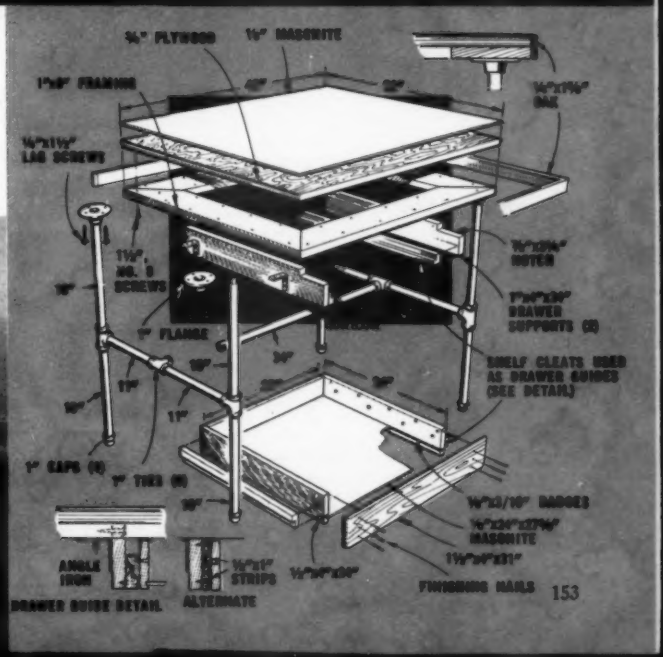
US ARMY

AN important requirement for needle-sharp quality in photographic enlargements is to have a rock-steady support for the enlarger. Too often, the tables used for this purpose are subject to swaying and vibration from the slightest jar. These movements, though barely perceptible, may be enough to degrade an otherwise fine enlargement.

The heavy table illustrated is made rigid with one-inch black [*Continued on page* 197]

JIGGLEPROOF ENLARGING STAND

FRAMING is screwed to the underside of the top which is ⅛-in. Masonite glued to ¾-in. plywood.



Automatic pair! The camera lens "squints" in the sun, opens in the shade, as your eyes do! You turn on the projector, *it* does the rest!

HOW THE KODAK AUTOMATIC 35 CAMERA HELPS YOU GET PICTURE-PERFECT

In sun, the electric eye makes the lens "squint" to a smaller aperture.

In shade, lens opens by itself to admit more light. Up to *f*/2.8 if needed.

Indoors, lens sets itself for available light. Signal tells you when to use flash.

With flash or for special effects, you can make lens settings manually.

EASTMAN KODAK COMPANY

New Kodak team shoots and shows superb hobby pictures *automatically!*

THE CAMERA: New Kodak Automatic 35 with electric eye *automatically* sets the correct exposure!

THE PROJECTOR: The New Kodak Cavalcade changes slides *automatically* while you enjoy the show!

Wherever you are . . . whatever your subject . . . here's a team matched for the most satisfying hobby pictures ever. It lets you shoot and show them *automatically!*

Picture-perfect exposures. The Kodak Automatic 35 Camera frees you from exposure calculations—so you can concentrate on your subject. You can move from sunlight to shade, shoot indoors with room light or photofloods, yet never make a lens setting. The electric eye does that *for* you. It adjusts the lens to the light. It even signals you when to use flash. And all *automatically*, whether you are taking snapshots or color slides.

You can get extra-closeups. Shoot small subjects and hobby projects as near as 2½ feet! Finder allows for parallax.

You load fast. No threading. One thumb flick winds the film. And the fast *f*/2.8 lens means speed to spare, even in dim light.

Perfect picture shows. The new Kodak Cavalcade Projector, Model 520, changes up to 40 slides in succession—*automatically!* You set it just once for 4-, 8- or 16-second change intervals. Turn it on, and it does the rest. You never have to lift a finger.

Your slides stay in focus from first to last because they're preconditioned by warm air. They're kept safe, too—each held in its own steel protector.

You can point out details on the screen with the shadow arrow. Edit as you show. Lift out any slide as you go. For a second look at slides already shown, or to skip ahead, just touch the control wheel.

And all the time, you and your guests enjoy beautiful slides shown at 500-watt brilliance *automatically!*

See this great automatic pair demonstrated at your Kodak dealer's. The Kodak Automatic 35 Camera is only $84.50, or as little as $8.50 down at many dealers'. The Cavalcade 520, only $124.50, or as little as $12.50 down. Hitch this team to *your* hobby. You're sure to enjoy it even more!

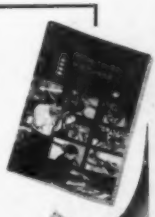
RESULTS EVERY TIME

Bright-frame finder shows framing allowance for 3 and 5 feet.

You focus as near as 2½ feet. Or even closer with Kodak Portra lenses.

HOW-TO PICTURES—

See your dealer for a copy of the 64-page Kodak book, "How-To-Do-It Pictures," 50 cents. And write our Sales Service Division for a free copy of the catalog "Kodak Books and Guides."



Kodak
TRADEMARK

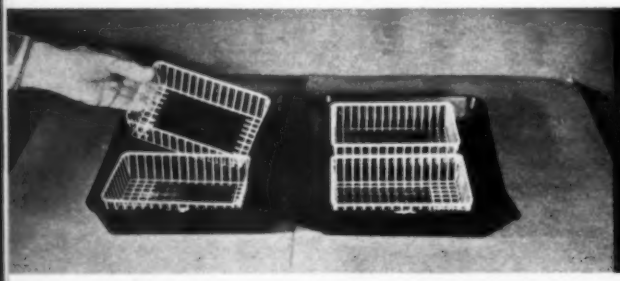
(List prices, including Federal Tax, and subject to change without notice.)

Rochester 4, N. Y.

FAST COPIES of letters or legal documents can be made by placing them in a printing frame—printed side toward the glass—and contact printing them with a high contrast paper. Result is white on black.

TEST a washed print by letting a few drops of wash water drain from it into a one-ounce solution of ten grams mercuric chloride to one pint distilled water. If solution clouds, print still needs washing.

PHOTO SHORTS



THOSE SMALL PLASTIC food baskets make neat containers in which to process cut film. Perfect for your 4x5 negatives, they can be used in each step from developing to washing.

HANDY magnifying glass for viewing images on view camera is made by gluing a small high-powered lens to one end of a cardboard tube. Tube length should be such that critical focus is obtained when open end of the tube contacts the ground glass.

RULY NEW...ALL NEW...from YUBA

SAWSMITH Radial Arm Saw

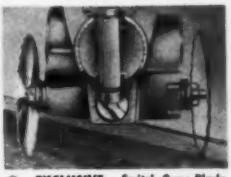
with the

BIG 5

exclusive features

1. **EXCLUSIVE**...Out-Front Controls — one hand loosens, locates, locks

2. **EXCLUSIVE**...Vari-Speed Drive — 7 speeds, not just one



3. **EXCLUSIVE**...Switch-Over Blade — puts all cuts fully on table

4. **EXCLUSIVE**...one-piece Sliding Table — no fence-fumbling

5. **EXCLUSIVE**...Coil Cord — safely and always out-of-the-way

Now . . . do it *yourself*—do it better—on a SAWSMITH. It's the newest radial arm saw . . . *does* so much more but costs *no more*. The exclusive Big 5 features put new use into every phase of woodworking. SAWSMITH makes fine craftamanship so simple you do a professional job on *very first time!*

You just decide and guide. SAWSMITH furnishes skill and precision for *fourteen* basic operations, does hundreds of jobs . . . enables you to convert instantly from one operation to the next. It's the *only* saw with the right speed for every power sawing job—from softest pine to toughest oak.

Whether you're a hobby-man or handyman, you'll find SAWSMITH a revelation in time and money-saving . . . a responsive tool for creative man-type talent.

See it at your dealer or Montgomery Ward store. For literature on SAWSMITH's exclusive BIG 5 features and 25 extra values, write Dept. RMI-11.

Manufacturers
of world-famous
SHOPSMITH Mark 5

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800 EVANS ST., CINCINNATI 4, OHIO
A Subsidiary of
YUBA CONSOLIDATED INDUSTRIES, INC.

YUBA

FINISH YOUR WOODWORKING PROJECTS THE WAY EXPERTS DO

From the people who know what's good for wood, Weldwood Wood Finishes and Waxes help you get professional-looking results quickly and easily.

WELDWOOD FIRZITE®. Penetrating resin sealer and undercoater to prevent wild grain, checking, grain raise. *White* for pickled or blond effects, and as first coat on all paint jobs. *Clear* to assure even penetration of stain, and as stain base when mixed with colors-in-oil.

WELDWOOD SATINLAC®. New, improved formula with greater solids content goes farther, works easier, is nearly odor-free. Brings out and preserves natural wood beauty with no "built up" look.

WELDWOOD SATINLAC® LIGHTENER. New, anti-wetting agent retains native wood tone. Prevents darkening usual when new wood is finished. Follow with finish coats of Satinlac.

WELDWOOD WAX. In rich high-carnauba *Paste* and easy-to-use self-cleaning *Liquid Paste*. Resists water-spotting, won't build up deposits that crack, flake, or discolor floors, wall paneling, or furniture. Leaves a hard, protective shield that guards the wood's beauty.

On sale at leading lumber, paint, and hardware dealers

WELDWOOD® WOOD FINISHES · WAX

UNITED STATES PLYWOOD CORPORATION

EVENING PROJECT

SPRUCE UP YOUR GUEST CLOSET

TRIM APPEARANCE of this closet was accomplished by painting all the coat hangers white and lining the shelf with plastic.

COVER THE SHELF with a contrasting color of Contact. To use, peel off the protective coating and smooth it in place as shown.

COAT HANGERS should all be of same size and shape. Hang on a line and spray.

READY FOR A FLYING START

AS A U.S. AIR FORCE PILOT

The Air Force pilot is a man of many talents. He is, first of all, a master of the air—and no finer exists. In addition, he has a background in navigation, airborne electronics and engineering. Then, too, he must show outstanding qualities of leadership, initiative and self-reliance. In short, he is a man eminently prepared for an important technological future in the new Age of Space.

Find out if you can qualify for training as an Air Force pilot. Paste the coupon below on a postal card and mail it now.

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AVIATION CADET PROGRAM

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Aviation Cadet Information, Dept. M-911
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Please send me details on my opportunities as an Aviation Cadet in the U. S. Air Force. I am a U. S. citizen, between the ages of 19 and 26½ and a resident of the U. S. or possessions.

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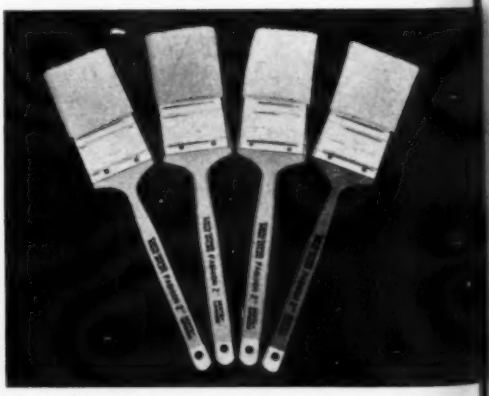
FRESH PAINT TIPS

SOLVENTIQUE is nonflammable paint and varnish remover. A powder, it is mixed with water, can strip off thick paint in one application.
Antique Corner, South Bend 24, Ind.

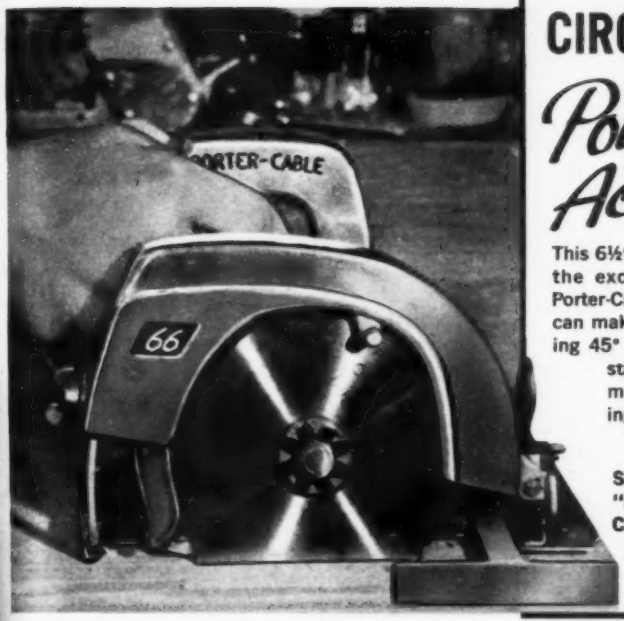
RESURFO spackling paste patches plaster, wood, tile, concrete—even canvas! A ready-mixed paste, it dries hard, won't chip and requires no priming.
The Reardon Co., 2204 N. 2nd Ave., St. Louis 6, Mo.

FOR A SMOOTH JOB lay a piece of aluminum foil over that fresh plaster patch and roll as shown.

NEW PAINT BRUSH COMB forces excess paint from bristles and prevents drying paint from clogging the heel of the brush.
Main & Sons, Inc., 257 Pascack Rd., Paramus, N.J.



COLORED PAINT BRUSHES have pink, blue, aqua or yellow nylon filaments and color-matching handles, come in two-inch widths.
Gerts, Lumbard & Co., 3409 N. Kimball Ave., Chicago



Porter-Cable

CIRCULAR SAWS

have

Power-Plus Accuracy!

This 6½" Saw is loaded with many of the exclusive features found on Porter-Cable professional models. You can make every possible cut, including 45° angles on 2 x 4's! Has instant depth and bevel adjustments . . . self-lubricating bearings . . . weighs only 8½ lbs.

A 3-STAR TOOL

Safety Kickproof Clutch
"No-Drag" Telescoping Guard
Cuts 2 x 4's at 45°

MODEL 66 **Only $39.95**

MODEL 146A
$74.95

6½" Heavy-Duty Porter-Cable Saw. Here is a professional saw at a low price. It's light in weight yet a powerhouse. Carpenters pick this model every time for speed and accuracy of cut!

A 5-STAR TOOL

- Ball bearings throughout
- Exclusive gear lubricator
- Safety Kickproof Clutch
- Blower Clears Line as Cut
- Calibrated Depth, Bevel Sets

Limited offer! Order your saw now! Send no money! Take 6 months to pay!

Porter-Cable
Quality Power Tools

PORTER-CABLE MACHINE COMPANY
926A Marcellus Street, Syracuse 4, N. Y.

Porter-Cable Machine Co., 926A Marcellus Street Syracuse 4, N. Y.

I wish to order the tools checked below. I agree to pay my Porter-Cable Dealer full price or down payment indicated upon receipt of tool, and the balance in monthly installments shown below.

	Price	Down Payment	Balance Monthly for 6 months
Model 66 Saw	$39.95	$9.00	$5.50*
Model 146A Saw	$74.95	$18.75	$9.95*

*includes service charge

Name_____

Address_____

City & State_____

And for smooth going with your car this winter, change to Quaker State

Quaker State winter oil is specially refined and cold-tested to flow freely at sub-zero temperatures. It gives complete, long-lasting protection to every moving engine part. Assures quick sure starts and carefree driving during the worst winter weather. Yes, Quaker State is the best winter oil your money can buy . . . Always ask for it by name—Quaker State!

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.

MI's Workbench

[*Continued from page* 112]

legs to the framework of the table. Use a ¼x4-inch carriage bolt in each corner, as shown in the photo and the drawing.

Now you can turn the table right side up and install the shelf. If you are planning to build the drawer section, omit the shelf. The shelf consists of a sheet of plywood, ¾x16¼x50 inches. It is screwed to the lower cross members of the legs by means of six, No. 8, two-inch flathead screws.

The tool board, which is optional, is 24x48 inches. It consists of a framework to which is screwed a sheet of perforated hardboard. Two 1x2-inch cleats, one on each side, secure the tool board to the back of the workbench. Its construction and method of fastening is plainly shown in the drawing and one of the photos.

Now then, suppose you want to build the drawer compartment—a good thought and a good thing too. The drawer compartment is of simple box construction with a single divider in the center as shown. The entire box is made of half-inch plywood with butt joints. The three cross rails which divide the box into six compartments, are ¾-inches square. They fit into notches cut into the box as shown in the drawing.

The box is designed so that it will fit into the recess beneath the workbench after the shelf at the bottom has been removed. Two lengths of 1½-inch angle iron are used to span the legs in order to support the box. The angle irons are a much firmer and stiffer support for the drawer compartment than the shelf. Mount the angle irons so that the drawer compartment will rest on *top* of the angle irons rather than between them. They are more rigid used this way.

Of course, at this point, you can now use the workbench to construct the drawer cabinet as well as the drawers. All the drawers are identical in construction and so they can be made in a sort of production line technique. However, before proceeding with the parts for the second drawer, it is a good idea to check the fit of the first drawer by assembling it and trying it. If it fits okay, well and good, you can proceed with the construction of the

[*Continued on page* 164]

For pro or amateur . . .

TOP POWER FOR THE JOB!

FOR HOME CRAFTSMEN

New B&D 6½" Utility Saw

SPECIAL INTRODUCTORY PRICE

$45.95

After December 25, 1959, $49.95

Quality at low price! With new sawdust ejector and calibrated depth adjustment *plus* all the features of heavy-duty models! Cuts to 2³⁄₃₂" at 90°, 1¹³⁄₁₆" at 45°. Perfect model for small budgets, now specially priced for limited time!

FOR THE PROFESSIONAL

Job-tested B&D 6½" H. D. Saw

ONLY **$69.50**

Top quality in a lightweight, heavy-duty saw . . . for use portably or in a saw table. Provides power to spare for any sawing job; cuts through a 2 x 4 at 45°. Cuts to 2⁵⁄₃₂" at 90°, 1⅞" at 45°.

See "Tools-Electric" - Yellow Pages - for Service & Sales

50th YEAR **Black & Decker®**

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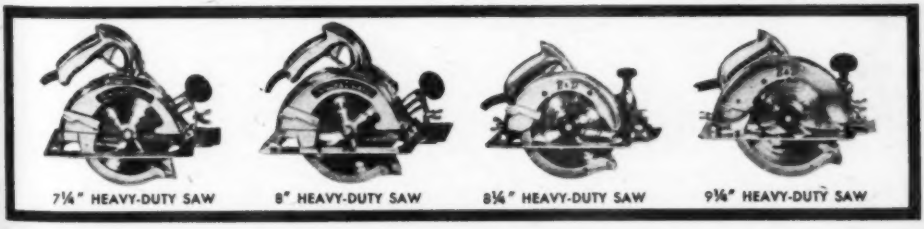
"TOP 10" SAWS

On the job at America's top ten construction projects



7¼" HEAVY-DUTY SAW | 8" HEAVY-DUTY SAW | 8¼" HEAVY-DUTY SAW | 9¼" HEAVY-DUTY SAW

FREE bit holder

with 6-piece Greenlee

ZIP BIT set

Get this handy new set of wood-boring power bits with FREE metal bit holder. Keeps bits protected and in order . . . gives instant size selection. Holds up to 11 bits. Comes to you free with set of six GREENLEE ZIP BITS sizes 3/8", 1/2", 5/8", 3/4", 7/8", 1".

Set with free holder, only **$3.90**

ZIP BIT has nonslip HEX SHANK

BORES IN ANY WOOD, AT ANY ANGLE, ANY SPEED

- Hex shank gives positive, *non-slip* drive . . . added strength
- Hex shank chucks quickly, accurately in any 1/4" or larger electric drill
- Cutting edges easily re-sharpened
- Heat-treated for long life

See your hardware or building supply dealer now for ZIP BITS with free bit holder.

GREENLEE

GREENLEE TOOL CO.

1843 Columbia Ave., Rockford, Illinois

MI's Workbench

[*Continued from page* 162]

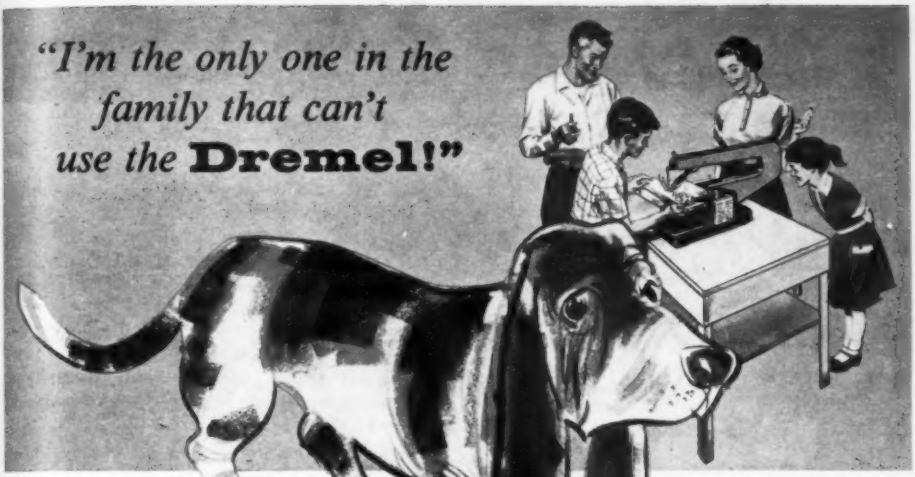
other five drawers by cutting the necessary sides and bottom. Note that the drawers are constructed so that the front panel of the drawer acts as its own stop. This means that when all the drawers are closed, they will all line up flush with each other.

After the cabinet has been completed, ease it into the space beneath the bench and screw the sides firmly to the legs of the bench. If there is too much space between the cabinet walls and the legs of the workbench, use shims to avoid pulling the sides out of square. If the fit is on the snug side, use a plane to shave down the workbench legs.

A touch of quality, which you will appreciate every time you use a drawer, is the use of Washington ball-bearing drawer slides (No. 2000N-19). Note that the width of the drawer makes allowance for the drawer slides. If you do not use drawer slides, the drawers should be made the full width of the compartments, less 1/8-inch for clearance. The drawer handles consist of black Stanley door pulls (No. 482) installed horizontally.

The entire workbench, the cabinet and all drawers should be given two coats of clear lacquer, unless of course, you want to paint it to match any existing workshop furniture you may have. For a neat job, install the drawer pulls *after* you have lacquered or painted the workbench.

—*Robert Brightman*



It's a dog's life when you're left out of things — but not so with a Dremel Moto-Shop. Here's an exciting way the whole family can enjoy a woodworking hobby together. Teaches children to be creative and helps cut down the TV habit.

Not a cumbersome cast iron model, but sturdy, lightweight, portable — and safe. Unique blade guard protects even the littlest hands. Simple operation — make gifts, toys, furniture, practical items for the home.

Treat your whole family to a Dremel Moto-Shop. America's most popular and useful multi-purpose tool.

- **Large capacity** — Has 15" throat — cuts 1¾" wood, light metal, tile, plastics.
- **Powerful ball bearing motor** — not a vibrator. 3,450 strokes per minute.
- **4-way blade holder** — saws in any direction.
- **Lightweight,** sturdy — easy to carry or store away.
- **Tilting table** — Tilts 45° for angle and bevel cuts.
- **Adjustable table** — Raises or lowers to new blade area.
- **Economical** — Self contained — no extra motor — no belts or pulleys.

A complete power workshop in 1 compact portable unit. Two models to meet any family's need.

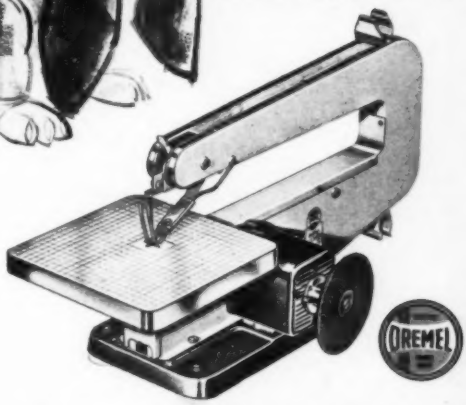
Model 571 Moto-Shop. Includes 15" Jig Saw with disc sander attachment only as shown above . . **$33.95**

Model 572 Deluxe Moto-Shop. Includes 15" Jig Saw with disc sander, grinding wheel and guard, wire and cloth buffing wheels, a 12 piece accessory set, and 30" flexible shaft (grinds, drills, carves, polishes, engraves, sands, sharpens) **$49.95**

Ask your Power Tool Dealer for a Demonstration

WRITE FOR FREE LITERATURE

DREMEL MFG. CO. Dept. 149-L Racine, Wis.



DREMEL POWER SANDERS — All Dremel Sanders have it — *Straight-Line Action!* Means you sand with-the-grain, get the smoothest finish. No swirl marks, no scratches. Three models — from **$14.85** to **$37.50.**

DREMEL MOTO-TOOL KITS — A compact, pocket-size machine shop. Grinds, polishes, carves, sharpens, drills, engraves. For fine detail work at home or shop. Speed range from 25,000-27,000 rpm. Prices, **$14.85** to **$27.50.**

DREMEL MOTO-SAW — The scroll saw everyone can use skillfully. Cuts the most intricate designs accurately at 7200 strokes per minute. Saws ¾" wood, light metal, plastics, floor and wall tile. **Model 203 . . . $6.85.**

New Dexall Caulking Compound

- Caulks stucco, wood, concrete, brick, stone.
- Permanently elastic.
- Easy-to-use cartridges.

Tough seal lasts for years!

DESHLER PRODUCTS, INC.
Deshler, Ohio

Fast, easy, foolproof way to repair wall cracks!

New Dexall Patching Paste

- New, improved, ready to use, for plaster and wood.
- Won't crack; water-resistant, smooth, easy-working.
- Needs no sealer . . . paint over in 15 minutes.

At paint and hardware stores everywhere.

Frostfish

[*Continued from page* 135]

$\frac{1}{16}$-inch running fore and aft. Grinding is easier after the angle is bolted to the oak. Drill bolt holes in the angle first and use them as a guide to drill holes in the oak.

Runners should be maintained as sharp as possible by grinding and filing. The hot rolled steel will not hold an edge as long as harder steels, so when your Frostfish starts to sideslip, quit sailing and break out the file. Runners can be hardened (not tempered) or a bead of tool steel can be welded onto the running edge and ground to a V shape. This latter trick, done by a competent welder, will reduce the need for frequent sharpening.

The entire boat should be painted before attaching the fittings. Prime the wood and paint or varnish it as desired. Two or three coats of good grade enamel should be sufficient unless the boat must be left out in the weather for long periods. Then at least four coats of enamel will be necessary.

Starting at the bow, screw the two plates (A) to the body top and bottom. Then screw on the two plates (D) for the steering post. Put the body in place on the runner plank, centering it exactly, and bolt it through the angles on the sides.

The steering gear shown gives automobile-type steering. That is, move the tiller left and the boat turns left and vice versa. You may wish to hook up the tiller boat-fashion so that moving the tiller to the left steers the boat to the right. This is the traditional arrangement and should be followed if you expect to sail against other ice boats. Simply lead the cables directly back around the drum without crossing them. If you do not wish to build a drum and cable steering gear, you can bolt a duplicate of the front steering arm to the flange on the steering post and connect the ends with auto-type tie rods. The steering cable or rods should be provided with a tightening device. Any slippage of the cable around the drum can be reduced by taking up on a turnbuckle.

Now for the go-power. We picked the lateen rig because of its simplicity and low cost. Although the Alcort Sailfish rig is not strictly an ice boat sail, it pushes Frost-

[*Continued on page* 174]

LOOK FOR THIS NICHOLSON FILE DISPLAY AT YOUR HARDWARE STORE!

It contains 8 popular files . . . each with a Hi-impact plastic handle designed to comfortably fit your hand. Handles can be removed and reused . . . will not peel or lose color. NOW EACH QUALITY NICHOLSON FILE COMES TO YOU AS A COMPLETE UNIT.

And Nicholson files from this display are factory-fresh just as they left our inspection line. A clear plastic skin helps protect them from dirt, dust, finger marks and abrasion.

Each file is carded, and to help you in your selection . . . has recommended uses. Price indicated, too. Look for this orange display at your local hardware dealer's. Choose a Nicholson file . . . there's one for every purpose.

NICHOLSON FILE COMPANY, PROVIDENCE 1, RHODE ISLAND

NICHOLSON

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Delta Homecraft 9" Tilting Arbor Circular Saw equipped with Extension Wings and Steel Stand.

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There never was a better time to start your home workshop—or an *easier* way to do it! Now—for a limited time—you can get a $21.00 trade in allowance for your old hand saw (any kind, regardless of condition) when you buy a new Delta 9" Tilting Arbor Circular Saw.

You'll like the *power* and *precision* you get for fast, easy, accurate cutting. And you'll appreciate the built-in safety features and industrial quality only Delta gives you. But, most of all, you'll enjoy the satisfaction of owning a power tool you *know* is the best—because it's backed by over 30 years of engineering skill and experience. Why be satisfied with anything less?

Don't wait—take advantage of this unique offer—see your Delta Dealer (he's listed under "TOOLS" in the Yellow Pages) or visit your leading Department, Hardware or Building Supply Store. Rockwell Manufacturing Company, Delta Power Tool Division, 556L N. Lexington Ave., Pittsburgh 8, Pennsylvania.

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FOR LAWN, PORCH OR ROOF

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Make your home a holiday show place with these delightfully different Christmas decorations! Durable paper patterns printed in bright colors are specially made to use on fir plywood. Simply paste on plywood and cut out with saw. It's easy. Strong, weatherproof Exterior plywood makes figures last for years. Make wonderful gifts. Order several today! Supply limited.

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Golden Hammer Award

[*Continued from page 129*]

Ariz.; Richard L. Pomeroy, Norwalk, Calif.; Hugo Scheideck, Taft, Calif.; George L. Berglin, St. Paul, Minn.; D. Reid, London, Eng.; Charles G. Jacob, Helena, Mont.; Neal Bowden, Lincolnton, N. C.; William C. Robertson, Fulton, Ky.; Herman Tjaden, Charles City, Iowa; James I. Buffenwye, Lombard, Ill.; Keith A. Monogan, Crafton, N. D.; J. W. Arthur, Charleston, W. Va.; Arthur W. Reeder, Danville, Ind.; John W. Giabbai, Falmouth, Mass.; Charles Merman, Philadelphia, Pa.; E. O. Luck, New Hartford, Iowa; R. Toole, San Jose, Calif.; Robert Cialuyeis, Staten Island, N. Y.; Kermit M. Siems, Mazeppa, Minn.; Charles W. Hunt, Tulsa, Okla.; G. Thompson, Ville La Salle, Can.; John A. Smith, Royersford, Pa.; Robert W. Johnson, Herbert O. Johnson, Worcester, Mass.; W. C. Cunningham, Santa Barbara, Calif.; Andrew A. Fehr, Menasha, Wis.; Evelyn Wales, Stepney Depot, Conn.; Charles Burcaw, Lowell Burcaw, Cumberland, Md.; Jerome A. Scabrini, Niagara Falls, N. Y.; Ralph W. Preston, Lowell, Vt.; Phil Cooper, North Island, N. Z.; Edward R. Wilson, Sheridan, Ore.; Ray M. Scotchbrook, Warren, Ill.; O. C. Davis, Alexandria, Va.; B. G. Murtiman, B. C., Can.; N. E. Vandeveer, Newport News, Va.; Jerry P. Dordan, Newport, Ore.; Leon A. Taddie, Oakland, Calif.

The following craftsmen have been awarded CERTIFICATES OF MERIT for their projects:

Morton Riddle, Marion, Ind.; William Pitt, Pittsburgh, Pa.; Ernest R. Stout, Lebanon, Ind.; Donald G. Boyum, Biloxi, Miss.; Bernard Barth, Bay Shore, N. Y.; D. F. Kirk, Waukegan, Ill.; Bernard Riedel, Clifton, N. J.; Doak Ewing, Cambridge, Ohio; Martin J. Thomas, Palm Desert, Calif.; Bruce A. Richardson, Hingham, Mass.; L. E. Miller, Odessa, Tex.; Ralph James Behrens, Brooklyn, N. Y.; Joseph Waller, Midland, Tex.; George J. Bastien, South Burnaby, B.C., Canada; Earl V. Peters, Richmond, Ind.; M. S. Christiane, Transvaal, South Africa; E. A. Jacobs, Denver, Colo.; Neal Dulley, Durban, South Africa; James Troxclair, Gramercy, La.; Raymond J. Courtemanche, Providence, R. I.; Peter Rugheimer & Bernard Boniface, Clemson, S. C.; James D. Gautier, Jr., El Paso, Tex.; Bryan Noe & Roger Glick, Eureka, Ill.; G. Spencer, Jr., Vancouver, B.C., Canada; Wendell M. Putz, Chicago, Ill.; Bernard A. Beck, Kearny, N. J.; Edward H. Kastner, Carlstadt, N. J.; John Ekstedt, Lynwood, Wash.; Dr. Vincent M. Kelly, East Meadow, L. I.; W. B. Gouger, Columbia, S. C.; John Yorke, Vancouver, B.C., Canada; Frederick E. Worge, Calgary, Alberta, Canada; Arnold Henry, Brooklyn, N. Y.; Robert O. Riggs, Portland, Tenn.; J. M. Senkus, Nanticoke, Pa.; Hugh Caldwell, Cleveland, Ohio; Edwin Minatra, Columbia, Tenn.; Frank A. Worstell, Michigan City, Ind.; John L. Hrebenar, Binghamton, N. Y.; Erwin S. Cibulas, Jr., Stratford, Conn.; H. Vander Schilden, Chicago, Ill.; George A. Curtis, Snohomish, Wash.; Jeff Douglass, Rocky River, Ohio; G. R. Helmfield, Lexington Park, Md.; Joseph R. Barber, Coventry, R. I.; George Lockwood, Washington, D. C.; Al Lovey, VAFB, Clinton, Iowa; Norris Frazier, Kamiah, Idaho; Albert M. Choinsky, Red Hook, N. Y.; William P. Cook, Nixon, N. J.; William Doerzbacker, South Ozone Park, N. Y.; William Helmer, New Orleans, La.; Richard H. Meyer, Burlington, Iowa; Ivan E. Prall, Malta, Ill.; John G. Nemec, Whippany, N. J.

Watch for names of more winners next month.

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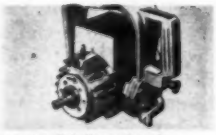

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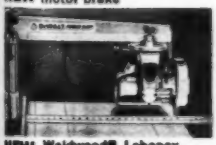

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The Fate-Root-Heath Company, Dept. MI-11, Plymouth, Ohio

Frostfish

[*Continued from page* 166]

fish along at a good clip. It will not stand up in 40-50 mph gusts because it is not as rugged as regular ice boat sails, so exercise some caution in strong winter winds. Other sails and rigs of similar area can also be used on Frostfish. Old Town makes lateen canoe rigs of 40, 45, 55 and 65 sq. ft. area and Grumman can supply a lateen rig of 45 sq. ft. and a Gunter rig of 65 sq. ft. Dinghy sails and spars could also be adapted. Whichever rig you use, be sure to locate it correctly on the boat. Take the trouble to work out the center of effort for your particular sail as shown in the drawing in the large-scale plans. This will insure good balance and trim.

You'll like Frostfish. We've certainly enjoyed the original. There's nothing quite like zipping over the ice, and when a good gust hits you—wow! That acceleration really racks you back in the seat. If you can get your friends interested, build two or three boats and enjoy some racing. Competition adds even more zest and you'll find yourself glad to be out when a winter wind is blowing. •

Planning Workshop

[*Continued from page* 123]

deeper from the top down to the bottom.

Plenty of electric outlets in the modern workshop are a must, so eight duplex receptacles were situated conveniently around the walls and two doubles were put in the ceiling. All receptacles are Pass & Seymour grounding type. Switches, out of children's reach for safety, control the current to these outlets.

All the power tools except the drill press and lathe, which rarely have to be moved, are bolted securely to heavy dollies equipped with heavy-duty, double ball-bearing casters. Thus it's a snap to shift heavy machines about the shop when necessary.

With attractive, easy-to-clean Armstrong asphalt tile flooring and pastel painted walls, the new shop is a cheerful and inspirational place to work. Everything is at hand because there's a place for everything and it's so easy to keep everything in its place. •

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We've put this "show" on the road—the world's finest motorcycle made better than ever by the world's finest craftsmen.

Spectacular styling with gleaming new headlight nacelle of aluminum alloy. Flowing back from the nacelle, new twin-flare tank paneling adds dash to the famous Duo-Glide look. Spectacular new performance is the result of a host of new mechanical improvements . . . quieter engine, longer bearing life and faster starts.

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Please send me new folder on the Duo-Glide for '60

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LUGER BOAT KITS

Dept. D-11, 9200 Access Rd., Minneapolis 20, Minn.

A Practical Darkroom

[*Continued from page* 141]

waterproof wet-table lining. It is impervious to photographic chemicals and wears like iron. Cut to size, it was bonded to the wood with contact cement. Liquid neoprene was then brushed along all joints to render them completely waterproof.

For draining the table a length of copper tubing was soldered to a standard sink drain fitting and tapped into the sink. To flood the table for temperature control of the solution trays, a short length of pipe was inserted into the drain and a rubber hose connected to the sink faucet was used to bring water into the area.

On the "dry" side of the room a recessed area was built into the partition to accept the enlarger. Plasterboard was used extensively because it is easy to work. Table and storage facilities were provided by running a continuous table along the end and side walls. To keep costs down, second-hand wood was used throughout. The basement ceiling was a bit low and would not allow full extension of the enlarger, therefore a recess was formed between beams and covered with plasterboard. The area immediately behind and above the enlarger was painted flat black to minimize reflections.

The contact printer was built as an integral part of the table. Illuminated with nine 7½-watt lamps, plus a red lamp, the unit makes an ideal negative viewer when not being used for contact printing. A quarter-inch piece of plate glass was recessed into the table top to form a flush surface to insure even illumination. Hinged plywood board lined with sponge rubber completed the printer.

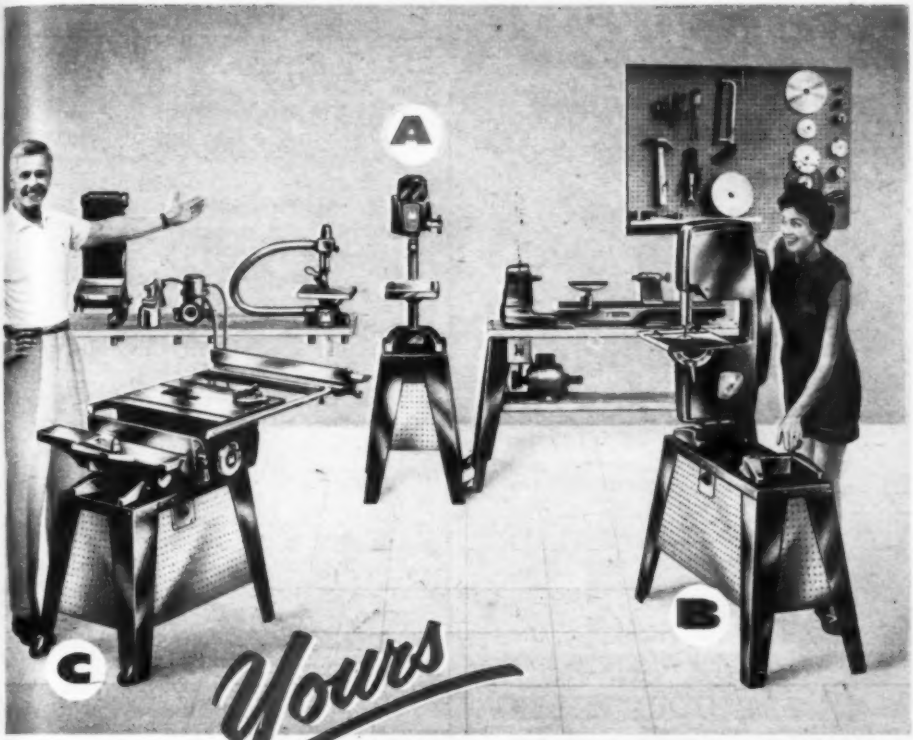
For easy access to the trimming board, hinge it to the table. When not in use it hangs down out of the way.

Brightly finished a gay, two-tone green, the functional design of this darkroom provides a pleasant place in which to work. •

BUILD YOUR OWN TELESCOPE

If you can repair a leaking faucet, you can make a reflecting telescope. For a complete set of plans, photographs, and instructions that will show you how to construct MI's portable six-inch telescope, send $2.00 to MI Plan Service, Fawcett Place, Greenwich, Conn.

Please ask for Plan No. P-6.



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SINGLE TOOL, SINGLE STAND

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SINGLE TOOL, DOUBLE STAND

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DOUBLE TOOL, DOUBLE STAND

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COMPLETE SHOP ON 3 STANDS and 1 WALL SHELF

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Your needs and *your* budget determine your "BUILD-UP" to a really complete shop of magnificent MAGNA power tools! With your first MAGNA tool, choose either single or double stand (the cost's the same). To start, select:

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ARCO ARROW METAL PRODUCTS CO.
Dept. MI-11, 421 W. 203rd St., N. Y. 34, N. Y.

Chevy Corvair

[*Continued from page* 66]

The seats are well-made and nicely pitched. There is perhaps a little too much glass area in the rear but the legroom is greater than in many of America's "big" cars. The power plant is an air-cooled pancake (or "horizontally-opposed") six, displacing 140 cubic inches. It develops 80 hp and grinds out 0-60 mph in 19.9 seconds with an excellent, compact automatic transmission. A stick shift, which is a beautiful floor mount, will undoubtedly knock two seconds off this, although I didn't test the stick job.

Zora Arkus-Duntov, who has been in racing about as long as Harry Truman has been in politics, had much to do with the development of the Corvair and is well-known for his record-breaking runs in Corvettes. Duntov was with me during the tests and he is the guy who told me there will be a kit available for those who want it in the not-too-distant future. As all you readers know, "kits" usually consist of a paper bag full of things to put here and there with which you can grow hair on the chest of an Edison Electric.

Now, as in most small cars, the question of "Where do you carry the luggage?" crops up. In the Corvair, up front where you usually find the gasoline burner, you find the trunk. This is a deep bin and will take a lot of weekend luggage plus a king-sized duffel bag. It took McMichael right up to the neck—and he's a king-sized duffel bag if you ever saw one. According to the Automobile Manufacturers' Association specifications, this trunk only has 9.5 cubic feet of space, which sounds pretty small. But let me assure you that nothing is quite as misleading as the cubic-foot capacity of the average trunk compartment. "How much will it hold?" is what counts because few people stuff a trunk with cubic feet. I've seen lots of trunks rated many cubic feet smaller than a competitor's that would nevertheless hold a great deal more luggage because of their shape. So it goes with the Corvair. For its size, it has a load of baggage space. There is also a bin behind the rear seat where a lot more thises and thatses can be stuffed safely.

Another thing that Corvair has done

[*Continued on page* 182]

Seven ways to save the life of your battery this Winter

Cold weather is rough on your battery. At 32°F. even a fully-charged battery delivers only 50% of its power! At 0°F. only 40%.

1 Starting causes the most drastic drain. So, before you start, be sure all electrical units — lights, radio, heater, etc. — are *off*.

2 If your car has a manual shift, be sure it is in neutral *and* depress clutch. Avoid flooding engine by pressing accelerator clear to floor *once*, then engage starter.

3 If engine doesn't start, check gas supply. In damp weather, wipe off spark plug porcelains with a *dry* rag. Then try it.

4 Cold garage? Not using your car often during extreme cold weather? It will pay you to buy an inexpensive trickle charger. Hook in overnight as required.

5 Best plan for cold weather: have your battery looked at, at least every 2 weeks, by your Texaco Dealer. He will check water level, test, and re-charge if necessary. This may save the life of your battery.

6 Keep terminal clamps *clean*. (Every time you have a Texaco Fall Safe-T check-up, your Texaco Dealer will remove corrosion and protect with coating of Marfak.)

7 Take the cold-weather load off your battery and engine by keeping crankcase filled with Havoline Special 10W-30. This is the *all-temperature* motor oil that stays free-flowing, prevents cold-starting wear (with less drag on your battery) — prevents harmful varnish, sludge and deposits.

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TRIP

leave no tolerance for dirt!

That's why AC has developed the new Triple-Trapper principle of filtration — protecting critical engine areas where lubrication must not fail!

The job of an oil filter is to remove every contaminant or foreign substance such as dirt, grit, metallic bits and carbon so they won't wear away or scar finely finished surfaces. Finely drilled oil passages must not be clogged by any impurity. For example:

In many engines you will find an hydraulic valve lifter between the camshaft and the push rod that actuates the rocker arm and valves. This key component keeps "play" or looseness out of the valve train and thus makes for quiet, efficient, split-second valving. The lifter has needle-fine valving itself which admits the oil so necessary for hydraulic operation. A tiny bit of metal or dirt could clog the opening and give you trouble. As long as an AC Triple-Trapper Oil Filter is on the job — and is changed regularly — such troubles are practically eliminated. AC conducts 96 reliability tests on its oil filters during manufacture to insure highest quality!

AC TRIPLE-TRAPPER Oil Filter

Now you can have the powerful Triple-Trapping action devised by AC Engineers

TRAP NO. 1 is the filtering element itself, a resin-impregnated material that traps particles as small as 1/15 the diameter of a human hair.

TRAP NO. 2 is the amount of filtering area. The AC filter has more *usable* area . . . or surface. Oil, passing through the filter, is spread out and slowed down over this greater area. Thus, the filter has a chance to catch fine particles. The trapped particles themselves form a filter "bed" on top of the filter element. This helps trap even finer particles.

TRAP NO. 3 is the design of the filter element, a unique arrangement of folds that provides maximum filtering area, hence maximum filtering capacity. Because of this greater capacity, the filter is able to hold *more* particles.

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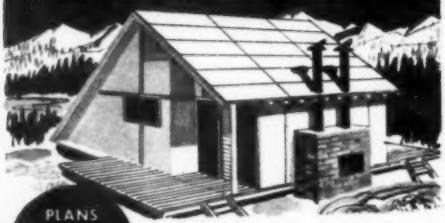

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Chevy Corvair

[*Continued from page* 178]

that is not usually possible with rear-engine rigs is to seal away engine noise so that at normal speeds there is just a whisper to remind you that something back there is pushing you. The body on my test car was well constructed—in fact, superior to some of its larger blood relations. The upholstery was passable. The biggest fault I found was that I bruised my fat head two or three times getting in and out. This job could use swivel seats like a gambler could use money.

Unlike its closest competitor, the Falcon, the Corvair has those dual headlights, which they need like I need more fat. The bumpers look somewhat inadequate for big city parking where the rule is to push, slam and shove. I think before many moons go by that bumper guards will be added, or there will be a lot of bent noses in Corvairville. Back to the tires.

Their size is 6.50x13 and the engineers recommend only 15 pounds pressure in the front and 26 in the rear. Usually when I make a hard test on a car I put my own pressures in first. In the interest of something or other I elected to go along with the factory specs this time. All my hard drifts and spins were made with 15 and 26 pounds. When I talked this over later with Duntov, I kind of felt he agreed (although he didn't say as much) that 20 pounds in front and 28 in the rear—or even 24 up front, depending on the load in the trunk—might be even better.

In summing up, as I said at the outset this is a great car. It's America's first major attempt at a rear-engine job since the Tucker and the result is a better-handling car than any of the rear-engine imports being made today. On my first turn over the road-handling course I went flat-out. I'll admit flat-out isn't very much at 85 mph tops. But the course was soaking wet, the curves were sharp, and "flat-out" in any car reveals its true handling characteristics. What impressed me most about the Corvair was that it is a fun car—fun to drive and fun to bend around hard twists.

I feel that Chevrolet will sell a county-full of these little jobs—though actually they're not *so* little. Interior-wise, they're

[*Continued on page* 186]

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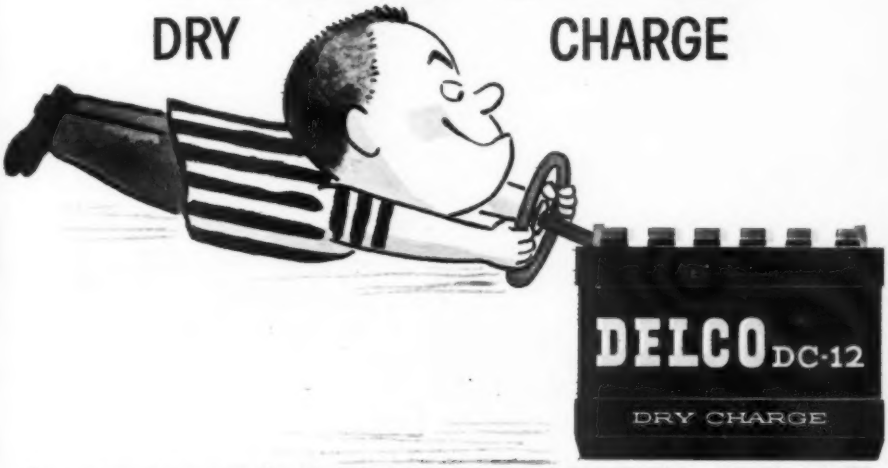
all

START WITH DELCO DC-12

DRY CHARGE



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Chevy Corvair

[*Continued from page* 182]

about the same as any of the Big Three of seven or eight years ago. I think thousands of Corvairs will be sold as second cars and thousands more as first cars. Aluminum has been used generously in the construction of the engine in order to keep weight down. The entire 108-inch wheelbase rig hits the scales at just a little over 2,300 pounds. Even the automatic transmission, a very heavy item in standard-size American cars, adds only 25 pounds to the weight of the Corvair. The Corvair is not something that Chevrolet's Prexy Ed Cole and his Brownies whipped up overnight. It's a well-thought-out car that has been kicking around on the drawing boards for some years—and its beautiful design is a tribute to the careful planning that went into it. •

The 1960 Cars

[*Continued from page* 79]

larger two have undergone some styling changes which, though not radical, have removed some of the bad lines of last year. In other words they've cleaned them up and the fin lines will be much easier to live with. The Rambler American, my choice as a top dollar value for some time, is basically the same as it has been for several years. The Ramblers are good automobiles, honestly made, and if you should buy one I feel positive you'll be happy about the whole thing. There's not much else I can say aside from the fact that in 1959 they had their best year in history and elbowed out many old-liners of the Big Three. They did it with product alone, as American Motors just doesn't have the kind of advertising money available to the Big Three.

About the only sensational news out of S-P for 1960 is the introduction of the Lark convertible. Larks come with Six or V8 cylinder power plants. A four-door station wagon is also new for this year. Lark had a good year, saleswise, and as you know, this may be just one other inspiration that caused the Big Three to move into the smaller-type car field. In 1959, a Lark won the Economy Run at the Daytona International Speedway.

[*Continued on page* 188]

VESPA

Tom McCahill, famous Automobile Test Driver says:

"Here is real fun . . . this car has a fantastic ride"

When Tom McCahill test drove the 1960 Vespa "400", he stated that he experienced a thrill unknown in driving for a good many years . . . that it steered with the alertness of a Grand Prix car.

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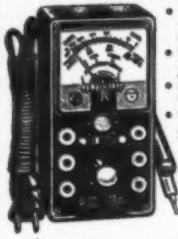

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The 1960 Cars

[*Continued from page* 186]

So that's about the way the new cars look for the coming year. How good a reception will they get? I think that as the three new compact cars go, so will go the market. They will serve as a definite barometer for American automobile thinking for many years to come. If they show immediate success and cut out a bigger hunk of total sales than anticipated, there will be at least three and possibly four additional entries in the small car field by this time next year, all sponsored by the Big Three. Just to be on the safe side, two new ones are already being readied for 1961.

Personally, I go along with the thinking that America is basically a big car country with big car needs. I feel that unless we have a depression of major size, or 60-cents-a-gallon gasoline, five years from now the so-called "big" cars (meaning present Chevy, Ford or Plymouth-size or larger) will still grab off at least 80 per cent of the market.—*Tom McCahill*

World Of Tomorrow

[*Continued from page* 83]

to have HECK come up with a simple snack or an elaborate dinner at a pre-set time. An ingenious delayed-transmission unit stores current to run this automatic household for 24 hours in case of power failure.

HECK will record telephone messages while you're out and turn up the electroluminescent panel-lighting to welcome you home after dark. A simple but thief-proof key-and-IBM-card arrangement permits HECK to receive goods and pay deliverymen by check during your absence. HECK will instantly signal for police if burglars try to break in when you are out or sound an alarm in case of fire.

A mobile radio-controlled unit to trim grass and hedges, powered by wafer-thin atomic batteries and responsive to HECK's command, is also planned for this dream house.

There are also a host of other startling electronic wonders designed to make life easier and more pleasant for you in the future.

Video cameras, for example, are already being miniaturized to the size of a package of frozen food for widespread home and industry use: nursery-watching, quality control in mass production, detection of pilferers, on-the-job training, etc.

To speed up the working of electronic computers which assist in such discoveries, the RCA lab recently devised a memory storage plate smaller and thinner than a four-cent postage stamp. It has 256 tiny holes in it and can keep a million facts on file and produce them in any combination or alone in milli-seconds.

But it is probably in the field of human health that the David Sarnoff Research Center will make its greatest contributions. General Sarnoff, Board Chairman of RCA, fully expects increased use of television to give any patient seriously in need of it the benefit of consultation among medical giants anywhere on earth. The marvels of our day, like artificial hearts and lungs and kidneys are, in Sarnoff's view, merely the forerunners of an electronic age soon to be upon us when they will be miniaturized and individualized to such a degree as to become "familiar as artificial teeth or hearing aids."

We will have sensitive electronic massagers to bring back life to paralyzed muscles. Artificial limbs set with tiny but powerful instruments, now in the development stage, will take advantage of the least nerve twitch to make those limbs perform with a measure of ease and gracefulness rivaling that of nature.

Two amazing proofs of how successful this determined invasion of the human body may be have recently emerged from Princeton Center. One is a tiny radio broadcasting station, about as big as a medium-size pill. Doctor has you swallow it while he listens to its signalled account of how you're doing inside. At the end of the examination, he removes it by pulling it up on a silk thread with little discomfort to you.

The other: a device to make blind men see. It is about the size of a cigarette filter and is a light-sensitive instrument which tells not only where light is coming from but how strong it is.

Set like a stone in a finger-ring, it will guide the hand of a blind person to a pre-

[*Continued on page* 190]

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World Of Tomorrow

[*Continued from page* 189]

arranged light source to perform routine tasks, such as running a switchboard or operating simple machinery. The light cell reacts to a glowing lamp—say for an incoming call—with a not unpleasant earphone hum which diminishes when the ring comes near and stops altogether when the hand wearing it is at the right spot.

"Some day," says Sarnoff, "we hope to make available a cheap but effective electronic tool to render the print on a page as a language of signals in earphones. When that day comes, the blind will also 'read.' "

These are just some of the electronic miracles that you will live to see. They are in the labs today. They will be in your home tomorrow. •

Invented A New Hat

[*Continued from page* 100]

free sample from the manufacturer; it was used in aircraft construction because of its lightness and weight. A disc of the stuff could be pulled and shaped as the wearer desired it; it could be functional, to keep off the sun, or chic—see the pictures.

One of their first customers was Darrylin Zanuck, the movie man's daughter, who runs a women's wear shop in Santa Monica. She ordered two dozen, wore one herself, showed them around the 20th Century-Fox Studios. Dody Heath (shown in photos), Joan Collins and Red Skelton (a hat collector) all bought Fantoppers, as the hats were called. Joan Collins' was pink, to match her sports car. Bob Hope wore one while golfing. Fantoppers became a fad, and Bob and Tom were soon operating a factory with a crew of seven workers, manufacturing a patented product. With this staff and some simple tools they get out 50,000 lightweight lids a month, each costing 50 cents to make. Retail price is about $2.00.

Neither Bob nor Tom expects to be making Fantoppers forever. But they have lots of ideas—many exciting toys, for instance—and they do expect to stay in manufacturing. They even have a notion of making a super surfboard someday. •

Shooting For Ducks

[*Continued from page* 88]

streams and flowages offer thrilling sport. Some of these are almost never gunned. But one of the most productive spots for jump shooting is along tidewater brackish streams, small rivers and salt water creeks. You may find competition there, but other jump shooters keep the ducks flying—and some may fly your way. I've been jump shooting in Maryland, New Jersey and Virginia and drifted into ducks so thick they rose in clouds. You can drift either up or down these rivers; if you work it right, you may drift down on the morning tide and back in the afternoon, or vice versa.

It is possible at times to take your limit of ducks jump shooting in very short order —so carry your fishing rods too.

The most productive sort of stream is one with high banks or tall reeds or cattails. These form a natural blind and triple your chances.

Best time? Early morning and late afternoon. On windy, rainy days from morn till night. Sometimes you can hear the ducks talking to each other or splashing gaily as they feed.

How? You jump-shoot ducks by sneaking up on them as you float or silently paddle along. No motors; these are illegal. You use a guide boat, canoe, rowboat or rubber raft depending on your pocketbook and the nature of the water. One companion is ideal. Two in one boat is all you can manage for successful jump shooting. You need one paddle and one alert gun. Take turns with one boon companion.

Go slowly, don't talk or even whisper. Don't smoke, either; many a hunter has ruined his chances by sending up smoke signals.

If there is wind and a light rain especially if you are paddling a flowage between two lakes, keep alert for ducks trading back and forth, flying low and at jet speeds.

When you strike trading ducks, it pays to pull your boat into the weeds or alders and hide it well. Then make a blind of the reeds. Select your spot carefully. There'll usually be one hot spot where more ducks cross than at any other; an oxbow in the

[*Continued on next page*]

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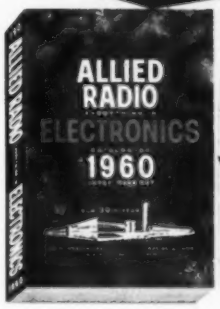

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river, over a small cove or along a few yards of shoreline.

When ducks are streaking in low and fast, this sport can offer some of the fanciest shooting in the world—and some of the most humiliating, even to experts.

There's just one way to slow this lightning down. Buy a duck call in your sporting goods store (if the ducks are anything but teal). Then learn to use it. If teal are your traders, try shrill whistles at them. This sometimes brings them within range and slows them up.

But I prefer jump shooting to trade shooting. There's something about floating a river that gets me. You never know what's just around the bend. I've seen moose in Canada, wild turkeys in Pennsylvania and once in Maryland I ran into half a hundred Canada geese and we got our limits right then and there.

What kind of boat? I've never seen anything to equal the Adirondack guide boat for larger streams. This craft is light (some weigh only 30 pounds), seaworthy on large lakes when you know how to handle them, and can move silently and fast with little or no effort. For streams too shallow for safe canoeing and with fairly fast current, the rubber raft is tops.

It has been my experience that jumped ducks give you a great predominance of straight-away shots at less than three feet from the water. Occasionally they'll rise straight up for six or eight feet then straighten out, and once in a great while they'll circle and give you dandy shots. My advice is to get in a lot of clay pigeon practice, especially on straightaways.

What gun? I like an automatic or semi-auto, though I've had lots of fun with a double. You can kill ducks with any gauge down to 20, but I think it more sporting to stick to the time-honored 12. This has the required fire power and doesn't leave so many cripples to die later of lead poisoning. Authorities tell me it takes only a few pellets under the skin to result in lead poisoning in time. So make it a 12 and don't take chances when they may be out of range. Forty yards is your sure-fire limit with regular loads and 60 with magnum. Make sure you kill your ducks so they drop in front of you *dead*.

Try jump shooting this fall—and let's hear about it. •

Know About Patents

[*Continued from page* 91]

handle your application. Write to the Patent Office in Washington and ask for a free roster of registered attorneys and agents in or near your hometown. You can also purchase the roster of *all* the registered practitioners in the U. S. It is called Register of Patent Attorneys and Agents, costs $1 and can be ordered from the Government Printing Office.

Can I complain to anyone if I feel a registered attorney or agent has not handled my case properly?

If you feel you have been unfairly treated by a registered patent practitioner, you can submit a written complaint to the Patent Office and an investigation will be launched.

Who will decide whether I get a patent?

The decision is up to a patent examiner. There are over 2,000 of them in the Patent Office. Each is a highly trained engineer or scientist. Many are also lawyers. When your application is received at the Patent Office it is assigned to an examiner who may be an expert in your field of invention. If he turns your application down, you have the right to appeal to a special three-man board in the Patent Office; if you lose your appeal, you can take your case into the Federal Courts.

How do I know someone in the Patent Office won't steal my invention?

In the entire history of the Patent Office, a period of more than 150 years, only one case of dishonesty has been uncovered. That was at the turn of the century when a patent examiner merely tried to *help* an undeserving inventor obtain a patent. The examiner went to jail. No one working for the Patent Office is allowed, directly or indirectly, to obtain or own an interest in a patent unless it is by inheritance.

Will publication of my idea in a newspaper or magazine endanger my chances of getting a patent?

Under the law an invention must be new. This means if it has been published

[*Continued on next page*]

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anywhere, in any language, longer than one year prior to date of application, that patent application may be rejected. The one-year rule makes allowances for scientists and researchers who want to write about their findings in professional journals, without losing their patent rights.

Can I protect my ideas by sealing them in a registered letter mailed to myself?

Whenever there is a conflict between inventors regarding who was first, the registered letter method is rarely treated as admissable evidence in court because it is considered self-serving.

How do professionals protect ideas?

Most of them make what is known as a witnessed disclosure. They describe their ideas as completely as possible in writing, including sketches. Then they get two people to sign a dated statement saying that they have witnessed and understood the invention. In the event of conflict, the witnesses may be called to testify under oath and this is considered reliable evidence. Many professionals keep a log in which they regularly record the progress of their inventions. They then have witnesses sign the log. The best protection, however, is to file an application for a patent as soon as possible.

Can you get a patent but keep the actual working of your idea a secret?

No. Every patented invention must be based on a full and complete disclosure of your ideas. Also your application must state clearly and fully how your invention works.

What's the best way to be sure my ideas are patentable?

The first and most important step is to conduct a search among similar inventions already patented. No matter how long ago a patent may have been issued on an idea similar to yours, chances are you won't get a patent. Most reputable patent attorneys and agents won't file your application until they have had the files searched in Washington, where all patents are filed in more than 30,000 different classifications of invention. The search room is open to the public and a staff of Patent Office experts is always on hand to help newcomers go through the files.

What does "patent pending" mean?

It tells the public that you have applied

for a patent. In this way, you can put your invention on the market prior to actual patenting and discourage others from stealing your ideas because if and when a patent is issued you can sue them for infringement.

If your patent application is passed, can they still refuse to issue a patent?

Yes. If the Patent Office deems that any part of your invention is useful to the Armed Forces, it may be classified Secret and you may never get a patent until it is declassified. For example, a scientist was recently awarded $340,000 for an invention he proposed in 1941. It is still in use but the government refused him a patent because of security reasons.

Will the Patent Office help you protect your patent?

No. Whenever you feel someone is making illegal use of your patented invention, your only recourse is to sue in the Federal courts. But if you lose your case, you can lose your patent.

Do you have to go to Washington to apply for or obtain your patent?

No. All dealings with the Patent Office must be in writing. The patent is mailed to you after you have paid the final fee.

Is it absolutely necessary to have a patent before you begin manufacturing?

You can manufacture your invention any time you please. But if you do so without a patent, you run the risk of losing all your ideas to competitors. Another good reason for patenting is that not all inventors do their own manufacturing. Many simply sell their inventions outright, or they sell manufacturing licenses for a percentage of profits, called royalties. Without a patent you have nothing to sell. In fact, most businessmen won't even consider your ideas these days unless you can show that you have applied for a patent.

Remember, there is no better way to protect your ideas than to apply for a U. S. patent as soon as possible. •

(Editor's note: The author of this article, Harry Kursh, has written a book entitled Inside The U.S. Patent Office. It will be published next month by W. W. Norton Co., Inc., 55 Fifth Ave., New York, N. Y. Price: $3.95.)

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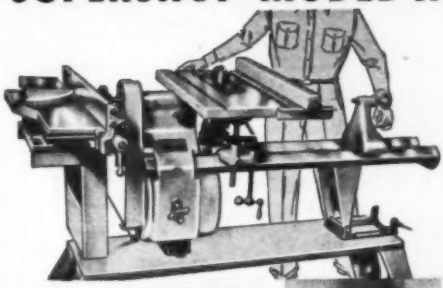

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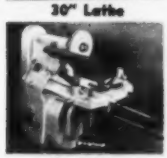

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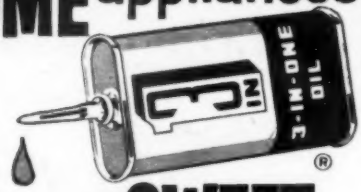

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Book Notes

DANGER IN THE AIR by Oliver Stewart; published by Philosophical Library, New York City. . . 194 pages. . . Price: $6.00

ERUDITE, fascinating, authoritative—Major Stewart's book is all of these. Writing from a background of experience in aviation covering the past 45 years, the author examines, reviews and analyzes all types of air accidents including those due to structural failure, icing, faulty controls, collision, fire, engine failure and crew fatigue. The chronicling of these tragedies serves a valid purpose indeed: to make planes safer for all who fly in them. Anyone who has had this experience, or expects to, will be intrigued—and reassured—by these vivid narrations of accidents which have brought ever-increasing safeguards to pilot and passenger alike.

VOLKSWAGEN GUIDE by William Carroll; published by Arco Publishing Company, New York City. . . 120 pages. . . Price: $2.75

AMERICA'S thousands of Volkswagen owners should snap up this book like *blitz*. It covers such intelligence as how to get the most performance and economy out of your VW, complete instructions for maintaining the car, specification charts for all models, and tips on improving performance through changes in ignition, carburetion and engine. One chapter is devoted to servicing and troubleshooting and lists over 75 symptoms of trouble and what can be done about it. Numerous photographs, diagrams and data charts supplement the informative text.

The ends of string and cord won't unravel if they are dipped in ordinary nail polish before being used.

Enlarging Stand

[*Continued from page* 153]

ron pipe supports. Pipe of greater diameter is even better, but anything less will not give the required rigidity. Bought new, our pipe was less than $8; used it can be bought from plumbers for half that. The plumber will cut and thread the pipe, too, if you're not equipped to do it yourself.

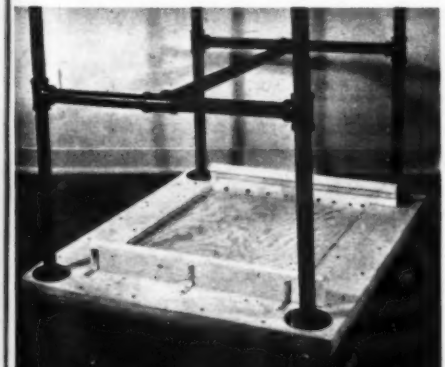
When the pipe and fittings are ready, cleaning with turpentine may be necessary to remove a preservative coating which would make painting impossible later. If the pipe is old, rust and scale can be removed with steel wool soaked in turpentine.

First construct the two H sections shown in the drawing. Use plenty of pressure in screwing the pipes together but not so much as to strip threads. A drop of light oil on each male thread will make it seat better. Next attach the H sections together with the 34-inch crosspiece, making them tight and square to each other.

The table top is ⅛-inch Masonite glued to ¾-inch plywood. This is further reinforced by a 1x6-inch frame, mitered at the corners and screwed to the underside. The drawer supports, with guides attached, are notched to fit inside the framing and fastened with nails on the inside and screwed angle irons on the outside.

After addition of the flanges and caps, the pipe legs can be secured to the table top. An oak finishing strip around the edge completes the top and the drawer is easily constructed as shown in the drawing.—*Don Hoppe*

DRAWER SUPPORTS are secured to framing with nails inside and angle irons outside.



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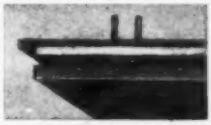

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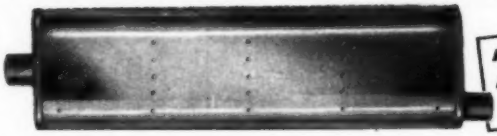

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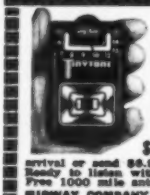

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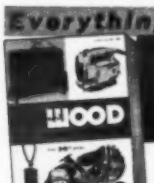

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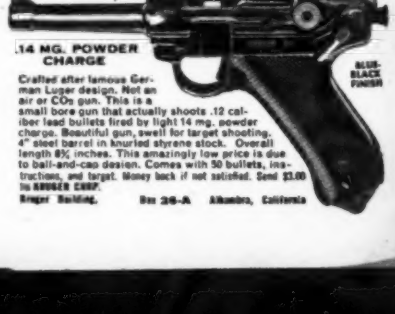

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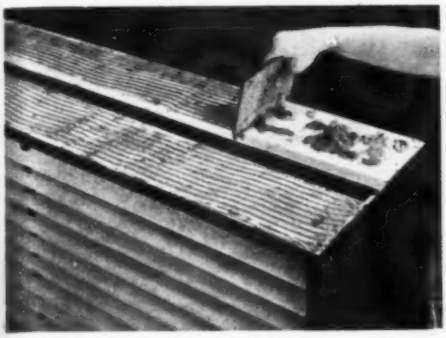
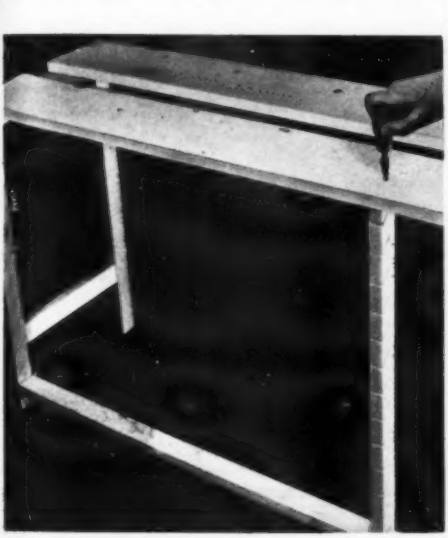
DeLuxe Radiator Cover

[Continued from page 148]



ADHESIVE for Marlite is applied with saw-toothed spreader as per instructions on can.



CENTERPOST is slotted for slats, fastened to the top board and lower rail with screws.

according to the manufacturer's instructions. The Venetian blind slats can be cemented in the slots, but they are held securely in place by the Marlite strips which cover the forward edges. Be sure to allow the cement to set thoroughly before putting the cover in place. The completed cover just sits over the radiator and is easily removed for cleaning. •

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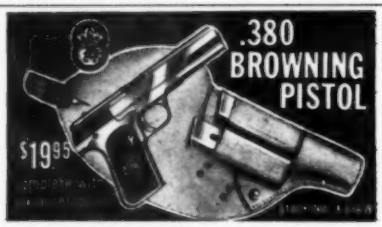

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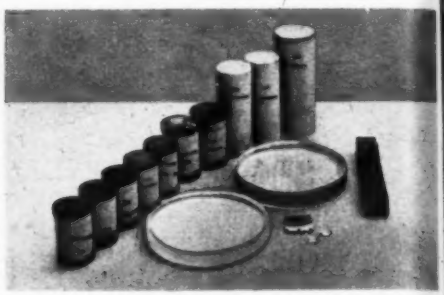
Sun Spot Photos

[*Continued from page* 150]



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and taping it over the front end of the tube. Any simple lens of long focal length will give good definition if stopped down to at least half of its original diameter.

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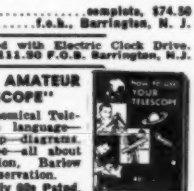

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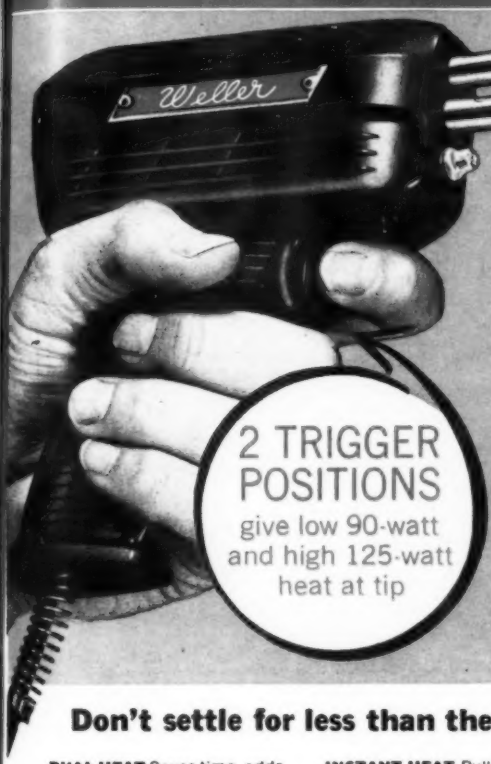

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